AUGUST 16, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

SAVED with less expensive sales costs

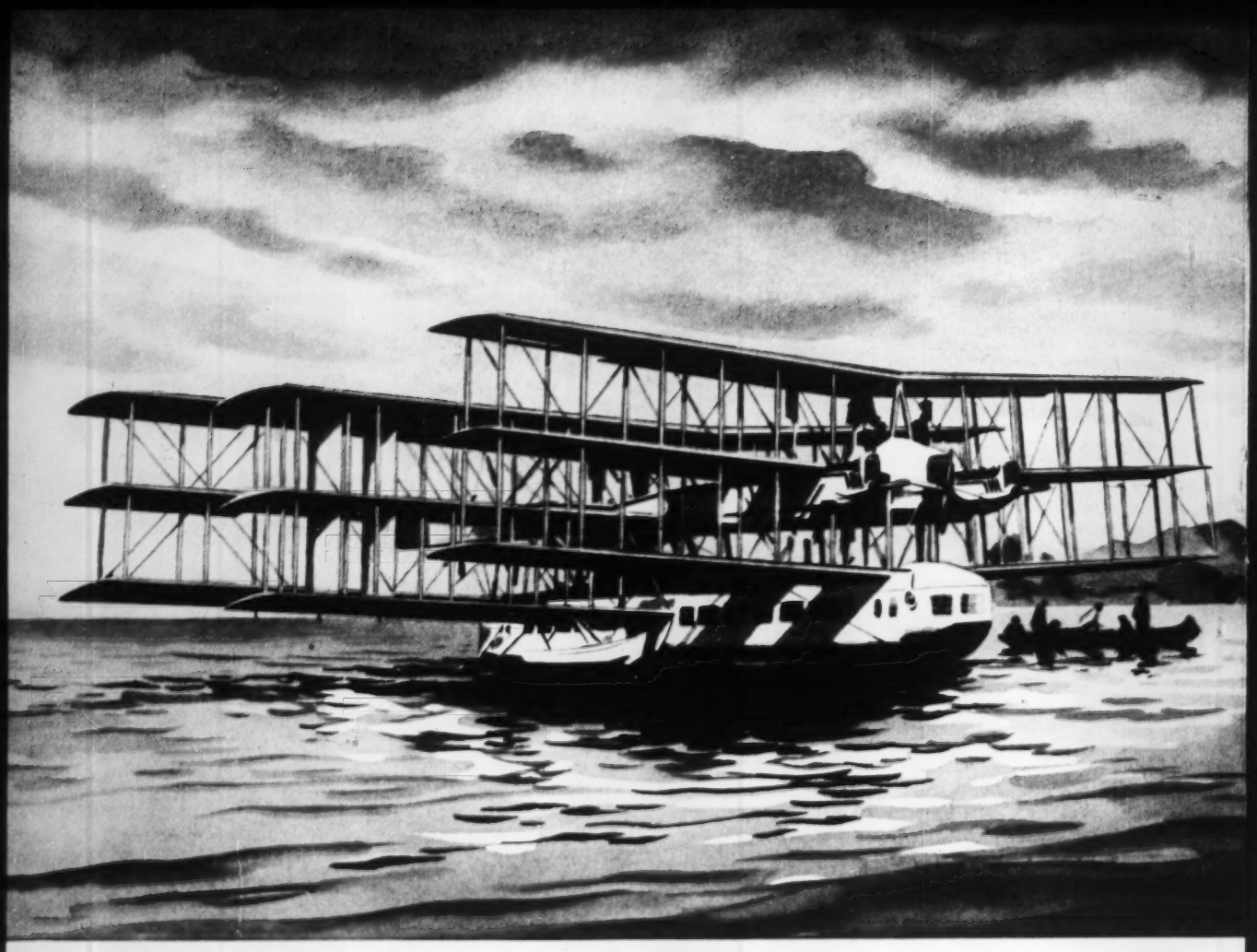
How To Reduce Sales Costs

Average cost of industrial sales calls is $17.24; of industrial orders, $187.39. To get more for that money or to cut those charges, see p. 65

SAVED with more profitable sales

SAVED with better marketing research

✔ **FASTENERS**
Design for Specials Becomes Standard, p. 96



This one looked great . . . on paper

FOR all its nine wings and eight engines, the 25-ton "Epocha," built over 30 years ago by the Caproni Brothers, never got off the water. It *might have* — but it was destroyed by fire before the first test flight. Success or failure? The world will never know. Yet multiple wing types, favored by many early designers, are just memories now — left far behind in the competitive struggle for existence.

Competition is a mighty strong force today. Because of it, manufacturers everywhere are seeking new ways of improving product quality and cutting manufacturing cost. That's where we come in. For precision finishing on Heald machines can often make substantial savings in production time — help build a better, longer-lasting product, too.

Your Heald precision finishing specialist will be glad to show you how the latest developments in automation, way-type and transfer Bore-Matics, new grinding methods and interchangeable tooling can be applied to advantage on your production line.

Competition is wonderful if you're *ahead* of it. Our business is to help keep you there. That's why IT PAYS TO COME TO HEALD.

THE HEALD MACHINE COMPANY

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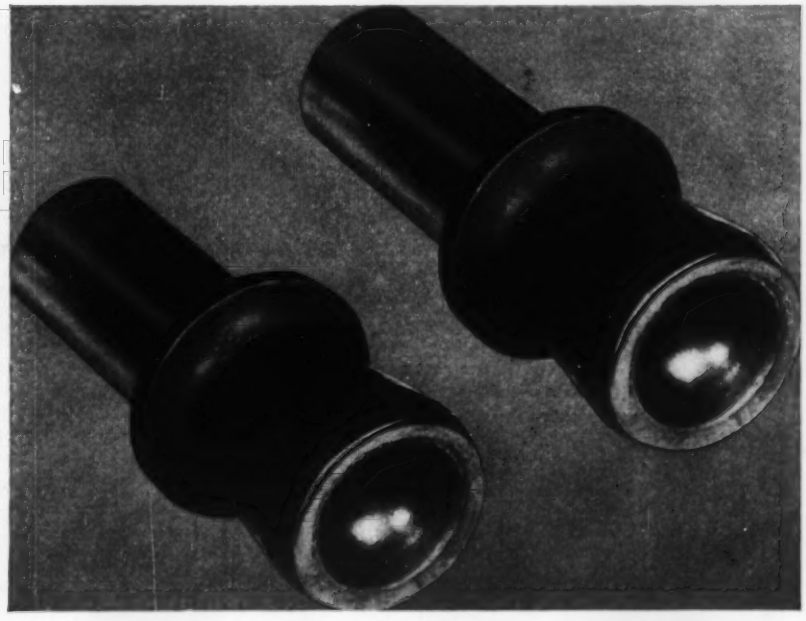
Detroit • Indianapolis • New York

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



Boiler Shop Using Bearcat Rivet-Sets Ups Average Run from 300 to 2470

The mechanical department of a large boiler shop had trouble driving more than 300 hot rivets, using standard rivet-sets. Once that mark had been reached, the sets would crack or spall. Sometimes recupping saved the day, but oftener than not the sets had to be replaced.

We were sure they could get longer runs with rivet-sets of Bearcat tool steel. The management gave Bearcat a trial, and put six sets to work after a heat-treatment cycle consisting of preheating at 1200F, air-quenching at 1750, and tempering at 550.

The results were even better than expected. The average run increased from 300 to 2470 before recupping was required. Not only that, but the recupping was accomplished without heat-treatment, which of course is a frequent source of trouble with rivet-sets of carbon tool steel.

Bearcat is an ideal tool steel for the manufacture of rivet-sets because of its superior shock-resistance. It is also well suited for uses where hot-work properties and easy machining are essential.

BEARCAT'S BIG FEATURES

1. Super shock-resistance
2. Deep-hardening . . . in air
3. Machines easily (Brinell 197 max)
4. Low distortion in heat-treatment
5. Good hot-work properties
6. Easily carburized for long wear

Typical Analysis

C	Mn	Si	Cr	Mo
0.50	0.70	0.25	3.25	1.40

In addition to being used for rivet-sets, Bearcat is ideal for such hot- and cold-shock applications as chisels, punches, hot headers and gripper dies. It has many other uses, too — master hobs, engraving dies, die-casting dies, and short-run dies used in cold-forming, blanking and bending.

You'll be well pleased with the service life obtained with Bearcat. We stock Bearcat in our mill depot. Or you can obtain a supply through your local Bethlehem tool steel distributor.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Use Care When Hardening Hot-Work Tools

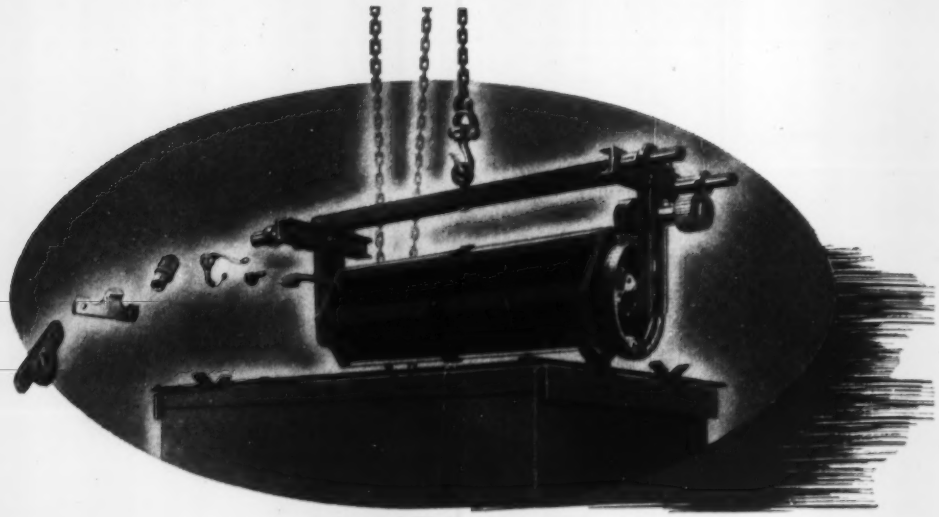
Although hot-work tools can be hardened to Rockwell C-56-60, there are hardly any applications where such hardness is beneficial. The majority of hot-work tools are used in a hardness range of C-41-44, or C-46-49. On new hot-work applications, a common mistake is to heat-treat to a hardness level which is too high for the application, with the result that rapid heat checking or breakage occurs.

For example, put tools of our Hot Work 8 analysis to work at C-55 or higher, and chances are, they will fail prematurely. Yet these same tools, used at Rockwell C-52 or lower, will give outstanding service.

On every hot-work application the best hardness level must be determined by experience. There's always a compromise involved, as the highest hardness is best for wear-resistance, and the lowest hardness is more resistant to heat-checks. Our suggestion? To be sure of maximum service, don't overharden hot-work tools.

IT'S A-H5 FOR LONG PRODUCTION RUNS

This high-production die, made of A-H5, blanks and punches sheet steel of 0.180-in. thickness. A-H5 makes possible long production runs between grinds. It holds a durable cutting edge, and resists distortion in heat-treatment.



Plating on Aluminum made EASY with Alumon

Hundreds of manufacturers throughout the United States are now using electroplated aluminum. The Alumon process is simple. The work is merely cleaned, dipped in acid, dipped in Alumon and is then ready for electroplating with copper, nickel, and other metals. The process is suitable for plating most wrought and cast alloys. . . The cost of using Alumon is low, being less than half a cent per square foot of surface area treated. The process can be fitted easily into regular plating cycles. Bulk or barrel plating readily done. Upon request we'll gladly send you the Alumon Process Bulletin.

Write for literature on Alumon and check list of literature on sixty Enthone products and processes for better metal finishing.

*TRADE-MARK REG. U. S. PAT. OFF. MANUFACTURED UNDER U. S. PATENT 2,142,564.

METAL FINISHING PROCESSES

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INCORPORATED

ELECTROPLATING CHEMICALS

442 ELM STREET
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Cuts costs. Here, push-button brushing finishes both sides of brass discs at a rate of 15,000 per day. Does a more uniform job many times faster than former hand method.

This study of *your* operations could save you thousands of dollars

Every day, Osborn Brushing Specialists make startling improvements in production jobs such as shown above. They do this by studying cleaning and finishing operations and making an **O**sborn **B**rushing **A**nalysis . . . a written report with recommendations on all jobs which can be improved with the latest push-button brushing techniques.

An **OBA** in *your* plant may save you thousands of dollars. It won't cost you a cent. Ask for an **OBA!** Call or write *The Osborn Manufacturing Company, Dept. G-22, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Saves 74%. A manufacturer of aluminum components is now removing burrs and blending surface junctures of parts at a rate of 1400 per hour, compared to 360 with former hand method.

Osborn Brushing Analysis

TO HELP YOU DISCOVER HIGHER QUALITY AND LOWER COSTS WITH POWER BRUSHING

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SEPTEMBER 29

SEPTEMBER 30

OCTOBER 1

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You'll see exhibits of the latest equipment, supplies and services; you'll hear leading authorities expound on every problem facing the industry today; you'll meet and talk to men whose problems are similar to your own.

And—you'll go back to your job reinforced with data that will increase your production efficiency and gear your organization to the competitive days ahead.

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This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 7 August 16, 1954

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

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As the Editor Views the News 49

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Bridgework: Volume's Up, and Getting Better 59

Windows of Washington 60

How To Reduce Sales Costs 65

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Technical Outlook 95

Fasteners—Design for Specials Becomes Standard 96
Multifunction specials eliminate components, assembly steps for user to become a source of production economy

Forging Titanium 100
Here are a few suggestions for production headaches. Design, die sinking and raw materials are covered

Progress In Steelmaking 107
Mill Users Favor Quality Refractories—To user, cost is compensated for by longer life, less maintenance

Helical Carbide Cutters Step Up Milling 115
Chip riddance and less vibration are features of these cutters. Cut three times as fast as standard tools

Hydrostatic Lubrication, Break Law of Friction 118
Secret is bearings always have a supply of lubricant. Here's a description of method that cuts down friction

New Products and Equipment 125

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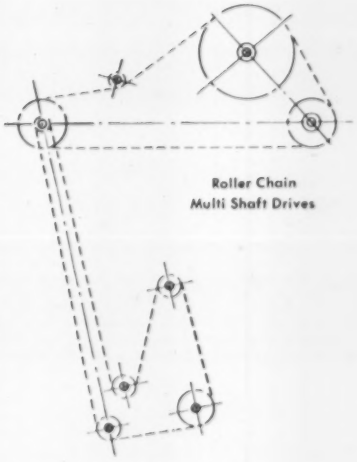
ACME CHAIN

Roller Chain
ENGINEERING SERVICE
'Yours'
FOR THE ASKING



Acme engineers will gladly work shoulder to shoulder with your designers to plan the details of sprocket, ratio, chain impact, tension, drive speed and other factors necessary to obtain the maximum efficiency and economy on your project.

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Write
Dept. 10-L for new illustrated 76 page catalog on use and application of roller chains and sprockets.

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The Toughest Metal Known . . .

Air-quenched . . . not harmed by reheating

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11%-13½% MANGANESE-NICKEL STEEL

- HOT ROLLED PLATES
- FLAT APPLICATOR BARS
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- Tensile strength to 150,000 p.s.i.
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behind the scenes

Look, Ma, No Friction!

"A motor you'd normally find in an electric clock drives the million-pound telescope at the Mt. Palomar Observatory!"

That's the way Harry Chandler starts his story on hydrostatic lubrication: a way to break the law of friction. How about that? A 1/12 hp motor moving a million lbs. of telescope. Is it the design of the telescope's bearings, is it lubrication? Turn to page 118 and read the story for yourself. Maybe you don't happen to have a little old observatory in your home, and maybe the most distant thought from your mind is a figure suggesting a low coefficient of friction, but when you get into Harry's story you're going to wonder where hydrostatic lubrication *was* all your life.

We asked Ambrose, the ambidextrous office boy, if he had improved his mind by reading Chandler's story. Ambrose said he had no time to improve his mind, that there wasn't any sense to it, and as far as he was concerned it was too late, anyway.

Ambrose Bursts

(Into Verse, That Is)

"Here's the way I got it figured," cried the manly young fellow, slapping a wrinkled sheet of wrapping paper on our desk. "I wrote that on the bus this morning. You can print it if you want to."

We explained that we couldn't even read it, whereat the honest youth confessed that the joke was on him. "I wrote this left handed, backward, and upside down," he said. "That's the way Leonardo Da Vinci kept his diary, you know. Listen, I'll read it to you."

"Da Vinci's diary?"

"No, no, this here poem I wrote backward. Ready? Here we go:

Adam was a stubborn man,
Adam was a schmo—
Had the world within his grasp,
Couldn't make it go.
How about that apple tree?
How about the snake?
Had Adam played it right, my friends,
The world would now be jake.
Symbol of a stubborn sex,
He sired all the jerks
Who tinker with the world today
And daily gum the works.
Adam's sons have had their chance,
And judging by the ruin
That follows politics and war,
They don't know what they're doin'!
Let *women* run the world a while!
Give *them* the robes and swords;
The gavels, pens and keys and seals,
And chairs on all the boards.
Let dames unravel worldly woes,
And govern as they please,
While *we* unravel fishing lines,
And plan a life of ease!
Let's gather up confusing things
That puzzle us like Hades
(Russians, saucers, atom bombs)
And hand them to the ladies.
Let's yield them all authority
They need to run the show,
And while they're solving all the ills,
Brother, leave us blow!

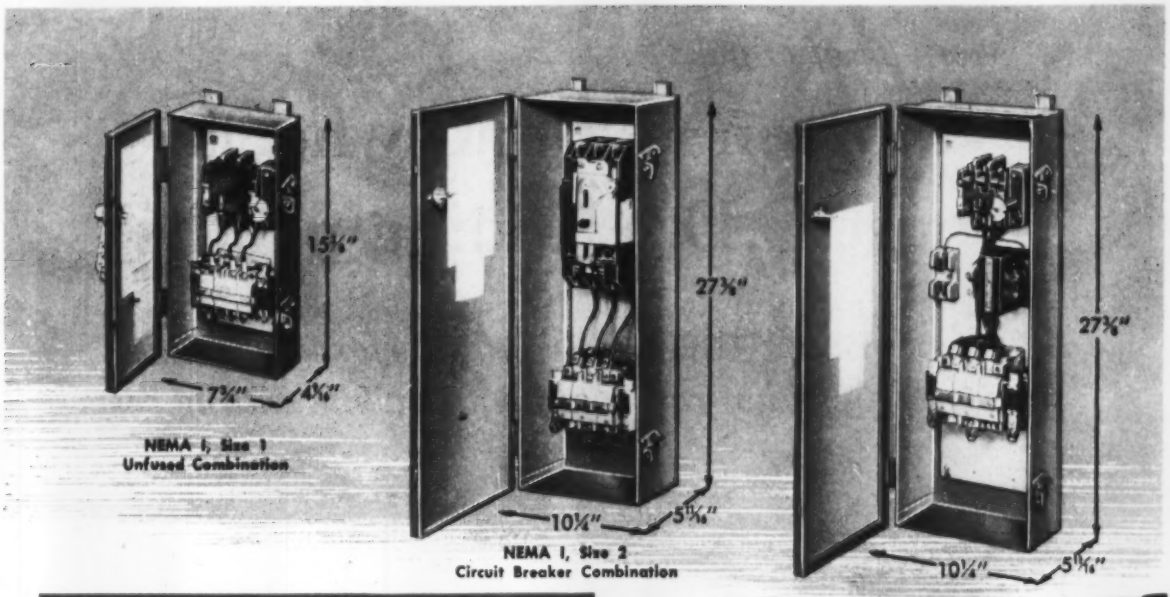
Cartoons Stir Workers' Pride

The Minneapolis-Honeywell Regulator Company's Industrial Division went into a huddle with itself recently, and when the huddle broke up, there was divisional training director C. L. Scheetz standing in the middle taking thought. "Since the dawn of the Industrial Revolution," declared C. L., "recurring cries have gone up that factory production presses the craftsmanship out of the worker's life and leaves it empty of everything but five o'clock and pay day."

Not a man to dawdle, Mr. Scheetz immediately established a novel factory poster program. Eighteen separate cartoon-style posters are rotated weekly in 18 factory locations in the division's four Philadelphia plants. They point out how the very products the employes help produce will ultimately regulate the manufacture of a variety of items they will purchase themselves. Since the firm turns out products which form the basis for more than 15,000 different applications stretching throughout the 450 industries of the world, Scheetz doubts there is any danger that they'll run out of poster subjects.

Shrdlu

(Metalworking Outlook—page 45)



NEMA I, Size 1
Unfused Combination

NEMA I, Size 2
Circuit Breaker Combination

NEMA XII, Size 2
Unfused Combination

New PERFORMANCE STANDARDS

for new machines or old with

ARROW-HART

TYPE "RAC"

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ENCLOSURES:

- GENERAL PURPOSE (NEMA TYPE I)
- INDUSTRIAL USE (NEMA TYPE XII) . . . built to JIC STANDARDS
- Also for Textile and Other Industrial Applications

AVAILABLE:

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- WITH CIRCUIT BREAKER TYPE DISCONNECT
- IN ACROSS-THE-LINE, REVERSING and TWO-SPEED TYPES
- IN NEMA SIZES 0, 1, and 2
- WITH AND WITHOUT CONTROL CIRCUIT TRANSFORMER, LOCAL CONTROL, AND OTHER MODIFICATIONS

Combining radically smaller size and lighter weight with the advantages of advanced safety and dependability, these revolutionary Arrow-Hart Type "RAC" Combination Starters outwork . . . outlast . . . outmode every other type. An all-new, front-operated disconnect—a new line of enclosures in NEMA Types I and XII — and the exclusive A-H "Right Angle" Starter set new standards for maintenance ease, superior performance, and control versatility.

YES! Arrow-Hart Type "RAC" Combination Starters will help all machines—*old and new*—realize their full productive efficiency. Extreme dependability helps eliminate costly down-time . . . smaller size, easily accessible contacts, and extra room in the enclosure provide the ultimate in installation and maintenance ease . . . Straight-Thru wiring improves safety standards.

You owe it to yourself to write for complete information — NOW!

MAIL THIS COUPON TODAY

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NAME _____
POSITION _____
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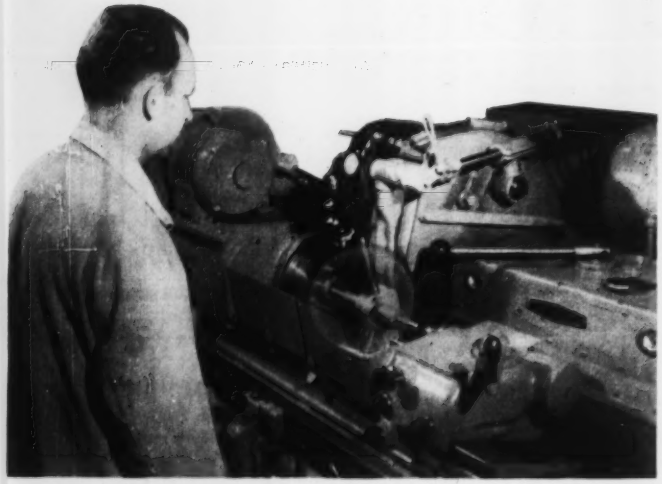
COMPANY ADDRESS _____
CITY _____ ZONE _____ STATE _____

More proof of how

Norton G Bond wheels boost O.D. grinding profits

Users praise "TOUCH of GOLD" *performance that steps up production rate and quality while cutting costs*



Cylindrical Grinding is faster, easier, more profitable when wheels made with the Norton G Bond — most efficient vitrified bond ever developed — add the "Touch of Gold."

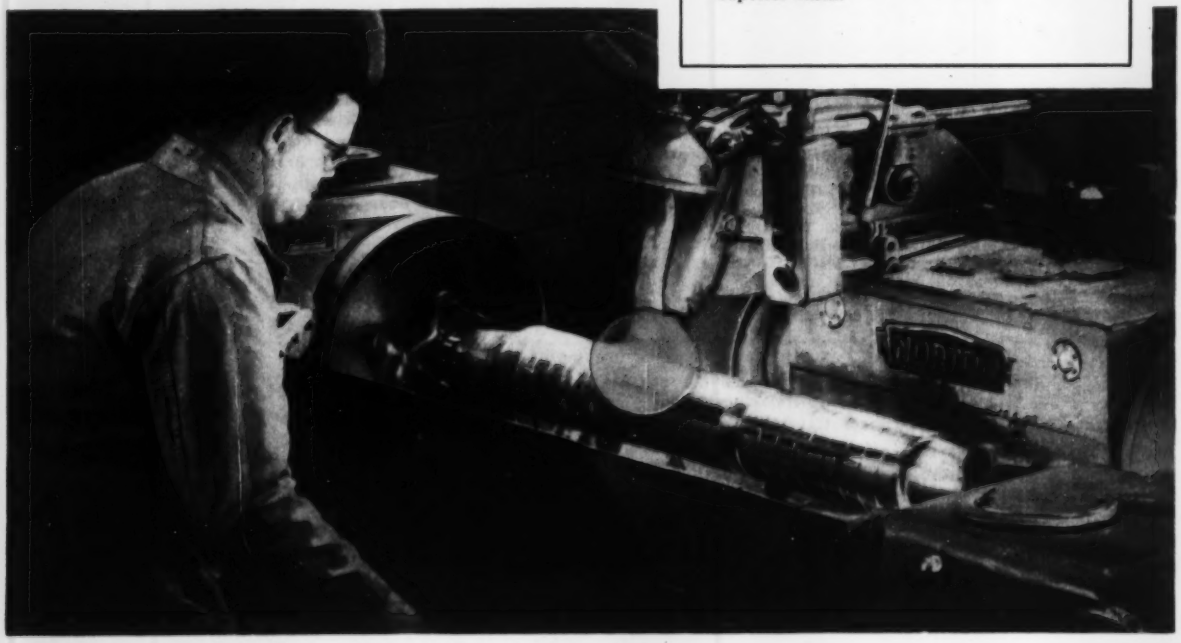
Users' Reports on Cylindrical Grinding

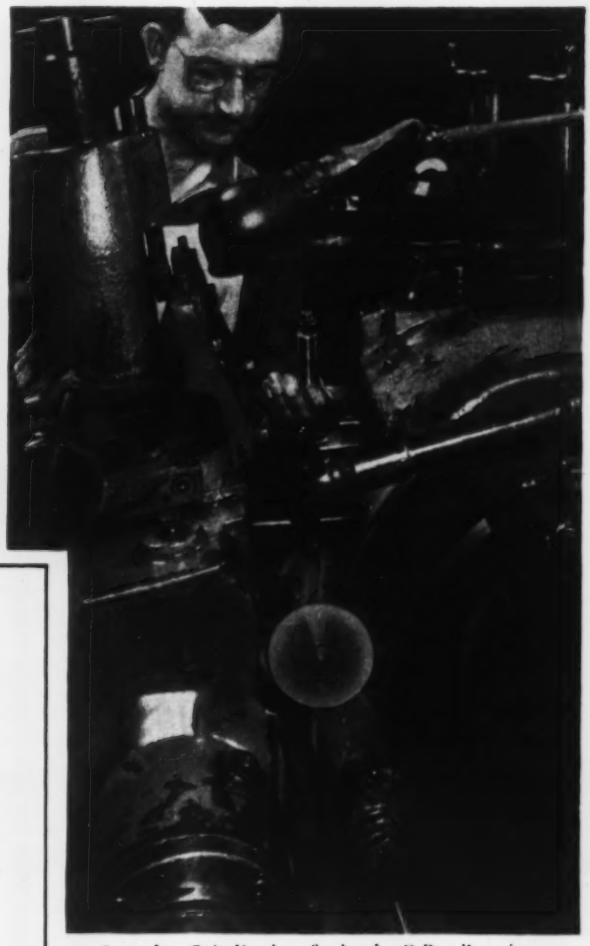
Job: Assorted small diameter stock.
Report: G Bond wheel gave 50% more pieces per dressing, with greatly improved finish.

Job: Rear axle pinions, SAE 4120 stock.
Report: Grinding to .001″ limits, G Bond wheels removed stock faster, more uniformly. Gave more pieces per dress, with less spark-out time.

Job: 3″ diameter formed roll, hard steel.
Report: Cooler cutting, crush-trues nicely, holds form. Best wheel ever used.

Job: Hardened steel raceways of ball bearing "inners."
Report: Ground 60 of the .075″ radius grooves per dressing, compared to 25 with previous wheel. This G Bond wheel, also used on critical shoulder job, held form and gave superior finish.





Users' Reports on Centerless Grinding

Job: ¾" diameter x 2" textile spindles, spindle steel.
Report: G Bond wheels produced better form and finish than any other wheels. Gave 50% more pieces per dressing on both rough and finish grinds. Also eliminated previous distortion of spindles due to overheating.

Job: Removing up to .010" per pass on varied steel parts.
Report: Dressing required only once every 4 hours, instead of every 40 minutes. Best general purpose wheel ever used on our centerless machines.

Job: Thru-feed ½" diameter bar stock, stainless steel.
Report: Cut faster and freer, held size better and gave better finish than previous standard wheel.

Job: ½" diameter shafting, drill rod and stainless steel.
Report: G Bond wheel gave 16 hours longer wheel life and produced much better finish.

Centerless Grinding benefits by the G Bond's unique ability to hold each abrasive grain just long enough for maximum cutting action — an important "Touch of Gold" advantage.

In O.D. grinding, as in many other precision and semi-precision grinding operations, first-time users of G Bond wheels are quick to recognize that here, at last, are wheels that will outperform any others they ever used. Advantages like these are the reasons why:

Cooler cutting action . . . faster stock removal . . . better finish . . . more pieces per dressing . . . longer wheel life . . . easier dressing, with less wear on diamond or on crushing roll.

Added up, all these new advantages mean valuable production economies and improvements in your product. That's why G Bond users have been glad to show their appreciation — with a steady stream of endorsements like those reproduced here.

Your Norton Distributor

is ready with proof of how G Bond wheels can add the work-speeding, profit-increasing "Touch of Gold" to your own cylindrical or centerless grinding jobs. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your classified 'phone directory. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. W-1575

Making better products . . . to make other products better

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NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
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More efficient two-blow cold heading of the above Leveling Screw was achieved when the manufacturer switched to Keystone "Special Processed" Wire.

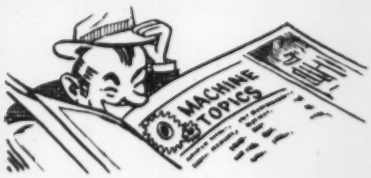
The excellent flow properties of this superior cold heading wire provided the desired upsetting and die forming qualities necessary to withstand the severe displacement of metal during the two blow operation. Longer die life, increased production, lower per-unit cost and a higher quality finished product were the end results.

Keystone is doubling its production capacity on "Special Processed" wire to meet the ever increasing demand of new customers while continuing to serve its present customers. Keystone is prepared to help solve any of your industrial wire problems. Your inquiry is welcomed.

Keystone Steel & Wire Company
Peoria 7, Illinois
Industrial Wire Specialists

LETTERS
TO THE EDITORS

Similarities in Selling



Think you have drawn a good similarity there, "Machine Topics" (July 26, p. 107), between selling insurance and machine tools: "Selling machine tools is like selling life insurance. You can show the prospective customer it will pay him to invest in a certain plan or machine, but nine times out of ten you'll still have to 'sell' him before he'll use the dotted line."

J. T. Vinbury
New Britain-Gridley Machine Division
New Britain Machine Co.
New Britain, Conn.

For the Army Engineers

Your article, "New Steel Passes Toughness Test" (July 19, p. 102), is of interest to our personnel engaged in the critical materials conservation program of the U. S. Army Corps of Engineers. Our conservation program would be aided considerably if we could receive permission to reproduce this article for distribution to laboratories and procurement offices within the Corps of Engineers.

Boyd W. Oman
assistant, Procurement Division
Military Supply
U. S. Corps of Engineers
Washington

• *Permission granted.—ED.*

Comments on Steel Guide

Your "Guide for Steel Buyers" (Section II, July 12) certainly shows a lot of very careful and concentrated effort. I think it will be very valuable to our salesmen to whom we are furnishing a copy.

R. C. Garlick
assistant vice president and
general manager of sales
Sharon Steel Corp.
Sharon, Pa.

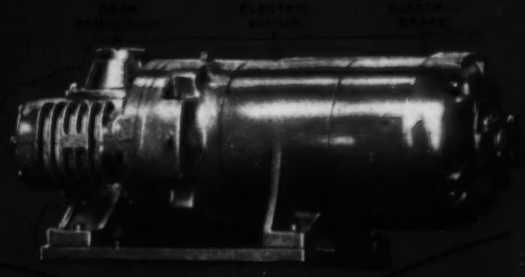
The thing that impresses us most with your "Guide for Steel Buyers" is its completeness with respect to the commodities which are covered. We believe, however, that it would be more useful to us if it included a more complete range of wire products than is the case. We also wonder whether there are not shown as producing points some locations which are not actually producing points.

All in all, this is a good, comprehensive guide.

A. J. Goddard
Northwestern Steel & Wire Co.
Sterling, Ill.

• *Thank you for your comments on the "Guide for Steel Buyers." There are various methods we could have used in*

(Please turn to page 12)

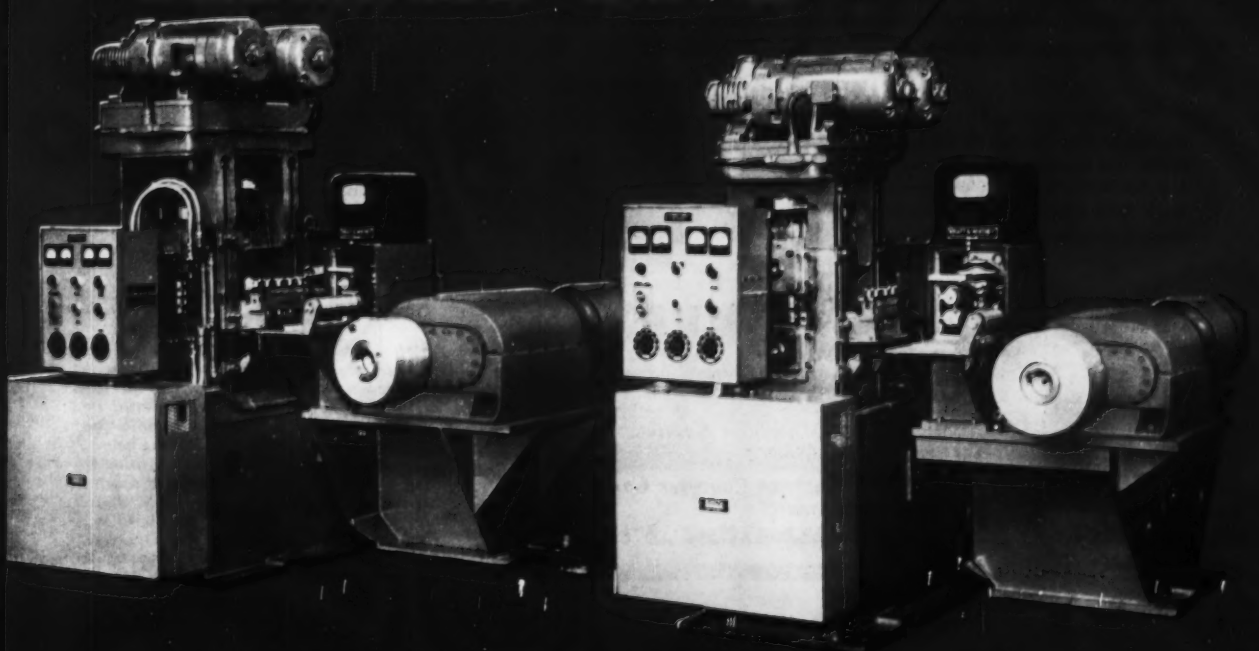


See how easily the standard electric motor, standard gear reduction, standard electric brake combine into a drive that gives the RIGHT horsepower, the RIGHT shaft speed, the RIGHT features . . . all in one compact unit. Nowhere else will you find power units that are so flexible, so easily adaptable, and in such a wide range of types and ratings.

Master power drives are available in thousands and thousands of ratings (⅛ to 400 HP) . . . in open, enclosed, splash proof, fan cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 430 to 1 ratio . . . with electric brakes . . . with fluid-drive . . . with mechanical or electronic variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best power drive for you.

standard units easily combine into special purpose drives

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

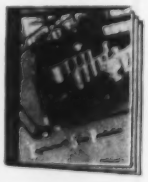


OVERHEAD TROLLEY CONVEYORS

one of the many types of high-quality power and gravity conveyers in the MATHEWS Line

Overhead Trolleys are among the most frequently applied types of power conveyers. They are used to serve processing machines, move material from one area to another, take components through painting, drying and enameling operations, and are, in fact, an extremely versatile type of equipment. Trolley Conveyers can be lowered, through the use of transverse bends, to working areas so that parts may be placed or removed from hooks or trays. They are used for storage conveyers, holding materials until needed and saving valuable floor space for production machines.

• Write for catalog HB53 for complete details of Trolley Conveyers and for other types of Power Conveyers and Special Conveying Machinery, or for Catalog No. 853, featuring numerous installations that might help you with your conveying problems. Both catalogs are yours for the asking.



MATHEWS CONVEYERS

GENERAL OFFICES . . . *Mathews Conveyer Company*
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PACIFIC COAST DIVISION . *Mathews Conveyer Company West Coast*
SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . *Mathews Conveyer Company, Ltd.*
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

LETTERS

(Concluded from page 10)

presenting the wire material but we felt it wise to follow the American Iron & Steel Institute's Steel Products Manual, Section 16 on Carbon Steel Wire. As to the listings of producing points, we made no attempt to check each listing. We relied on what the producers told us in response to our questionnaires.—ED.

Strictly on Adhesives

We have just read your article on adhesives and find it to be a most interesting resume, particularly the section dealing with misconceptions and facts.

May we have six tear sheets of this article?

R. B. Hitchcock
Mechanical Development Laboratory
E. I. du Pont de Nemours & Co.
Wilmington, Del.

We found your article, "Adhesives Join the Assembly Line," extremely interesting and informative.

As manufacturers of sintered tungsten carbide products we have a problem which we believe might be solved by the use of one of the newer adhesives. We are often asked to supply thin pieces of carbide, the finished tolerances being such that grinding of them is necessary. As they may only be 1/16-inch thick, the chucking of a material, which is only slightly magnetic, presents some difficulty. This problem would be solved if we could affix the pieces with some adhesive to a steel plate which could in turn be held magnetically on the grinder. After grinding it would be necessary to remove the adhesive so that the carbide pieces could be once more affixed for grinding the opposite face. In short we require a metal to metal adhesive which could be applied easily, which sets quickly and then can be removed easily after the grinding operation. The adhesive would have to be resistant to grinding coolant oils, and as these oils often form a hard film on the steel, it would be of some assistance if it would adhere to this film.

We would appreciate any information you might have on possible suppliers.

J. Bateman
Carmet Division
Allegheny Ludlum Steel Corp.
Detroit

• *The adhesive problem you describe is an interesting one and any one of the major adhesive manufacturers would be happy to tackle it. Among the adhesive manufacturers which have extensive research facilities are Minnesota Mining & Mfg. Co.; Rubber & Asbestos Corp.; Mechanical Goods Division, U. S. Rubber Goods Division, U. S. Rubber Co.; Industrial & General Products Division, B. F. Goodrich Co.; Armstrong Cork Co.; and Polymer Chemical Co.—ED.*

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Use Low Cost
STEEL
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SLEEVES · BUSHINGS · FERRULES
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PRICE LIST OF STANDARD SIZES IMMEDIATELY AVAILABLE
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With Plain Steel SPACER TUBES

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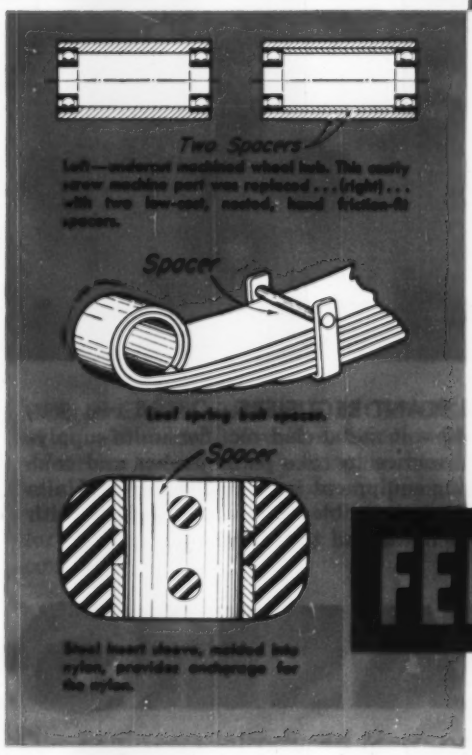

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Write Today For Your Copy!

Your business letterhead request brings the new catalog and price list. See the savings you make with spacer tubes. Ask for your copy *today!*

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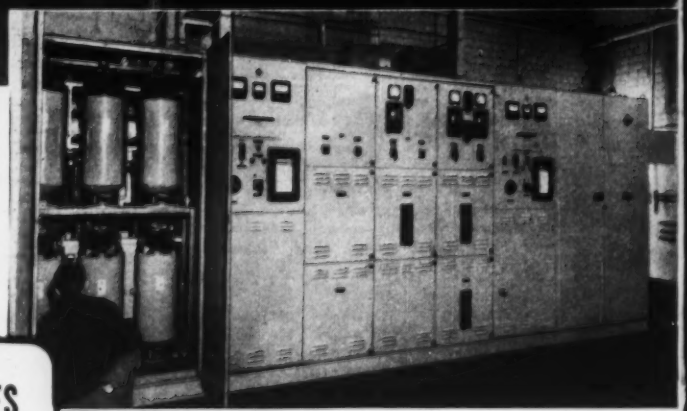
BILLET MILL RECTIFIERS: Two 1500-kw, 250-volt rectifiers supplying dc service to cranes and runout tables in 30 and 21-inch Billet Mills. Rectifiers are provided with automatic control and provisions for starting and stopping by manual or remote control.



*6 OUTSTANDING RECTIFIER FEATURES

1 **Continuous Excitation:** pilot arcs always present. Eliminates need for synchronized re-ignition. Enables rectifier to ride through severe ac voltage disturbances.

2 **Fixed Excitation Anode:** doesn't contact cathode mercury and is independent of level, turbulence or impurities . . . requires no adjustment, maintenance or replacement.

3 **Internal Cooling System:** high heat transfer with seamless tube cooling located within the rectifier.

4 **Enameled Anode Seals:** multi-layer fused vitreous construction provides high-strength seal unaffected by thermal variation.

5 **Grid Phase Control:** in cleaner region near anode, where ion density is lowest.

6 **Arc-over Free Tube:** insulating entire arc path eliminates danger of arcing-over to tube.

COKE PLANT RECTIFIERS: One of two 500-kw, 250-volt metal-clad rectifier units supplying dc service to coke plant pusher and coke handling equipment in Coke Oven area. Units are factory assembled and wired, complete with dc switchgear and transformers.

ALLIS-

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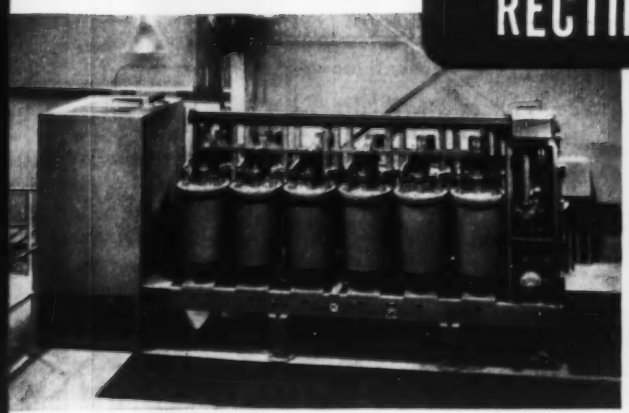
Material Handling

At Fairless Works of the U.S. Steel Corporation — the world's newest and most modern steel mill, continuous dc service is essential to material flow. Any interruption in this critical power supply would cause serious equipment damage and heavy production losses throughout the entire mill. Here, as in other mills over the United States, Allis-Chalmers mercury arc rectifiers are backing up their reputation for continuous, trouble-free operation under variable operating conditions.

In dc load centers located strategically throughout this gigantic plant, 19 Allis-Chalmers rectifiers produce *all* the 250-volt dc supply for every material handling operation . . . from unloading the ore to stockpiling finished steel. These rectifiers are designed and engineered for steel mill duty, and offer highest service reliability and efficiency with low maintenance features necessary for maximum mill output.*

For the same dependable dc service in your mill, specify Allis-Chalmers mercury arc rectifiers. Call your nearest A-C sales office for complete information, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4302

MERCURY ARC RECTIFIERS



OPEN-HEARTH FURNACE RECTIFIERS: One of two 1500-kw, 250-volt rectifiers supplying dc service to cranes, pig casting machines, bailer, slag cars, and stock house equipment. Provided with automatic control and provisions for starting and stopping by manual or remote control.

RECTIFIER TRANSFORMERS: Two 13,800-volt outdoor transformers feeding two 750-kw, 250-volt rectifiers in Central Maintenance shop. Rectifiers supply dc service to maintenance shop cranes, machine tool equipment and provide auxiliary power for electronic testing devices and welding machines.

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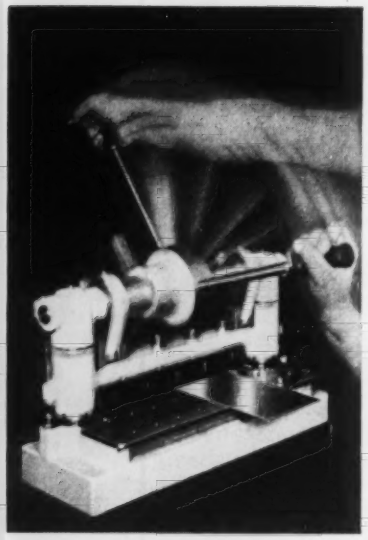

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*pronounced Die-ack-ro

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A Mechanical Eye to Watch Your Tools

Cross Machine Control Units Reduce Downtime and Tool Costs

(U.S. Patent Nos. 2679038 and D-163935. Others Pending.)

The Machine Control Unit was originated by Cross to solve tool changing and down-time problems in machines with multiple tooling.

Available for drilling, milling, boring, turning and similar machines, the Control Unit provides many benefits:

- ★ It reduces tool expense by minimizing breakage and grinding.
- ★ It is equipped with Toolometers which automatically stop the machine when tools need changing.
- ★ Other tools indicated by the Toolometers as *almost* used up are replaced at the same time. This grouping of changes drastically reduces downtime.
- ★ Pre-set tools are stored in the Machine Control Unit for instant availability at the machine.
- ★ Standard fixtures and gages are provided for pre-setting the tools to eliminate downtime for machine adjustments and trial cuts.

Over 300 Cross Machine Control Units are now successfully reducing manufacturing costs in plants throughout the country. It will pay you to write, wire or phone for full information *today*.

Master tool setting fixtures and two standard types of gages for pre-setting tools.

Established 1898

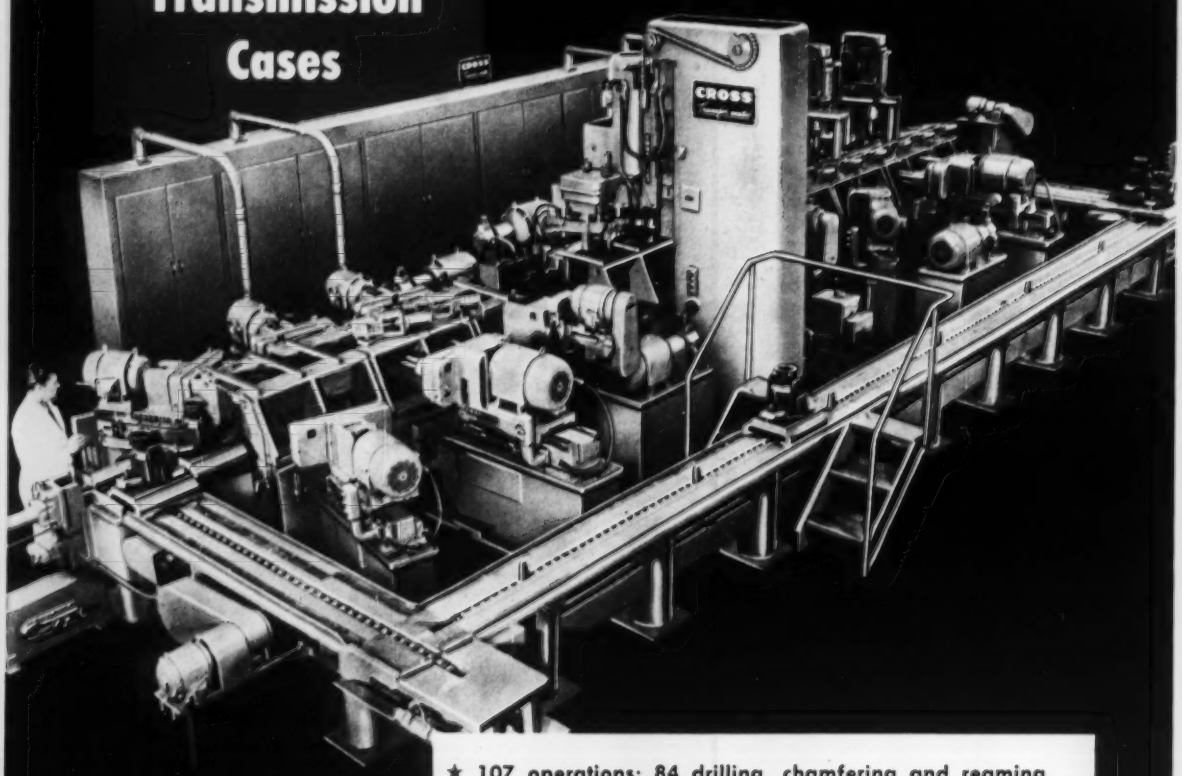
THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

Drills, Bores, Reams and Taps Transmission Cases

Another Transfer-matic by Cross



- ★ 107 operations: 84 drilling, chamfering and reaming, 8 spotfacing and counterboring, 4 boring, 6 tapping, 5 inspection.
- ★ 95 parts per hour at 100% efficiency.
- ★ 21 stations: 1 for loading, 1 for unloading, 15 for machining, 4 idle.
- ★ Machine stops automatically if critical tools are broken or improperly set for depth.
- ★ Pallet type work holding fixtures with automatic transfer from station to station and integral conveyor for automatic moving from unloading to loading station.
- ★ Complete interchangeability of all standard and special parts for easy maintenance.
- ★ Other features: Hardened and ground ways, built-in chip conveyors, hydraulic feed and rapid traverse, individual lead screw feed for tapping, automatic lubrication and J.I.C. construction.

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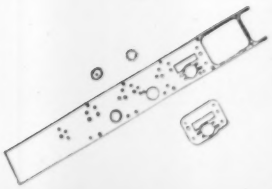
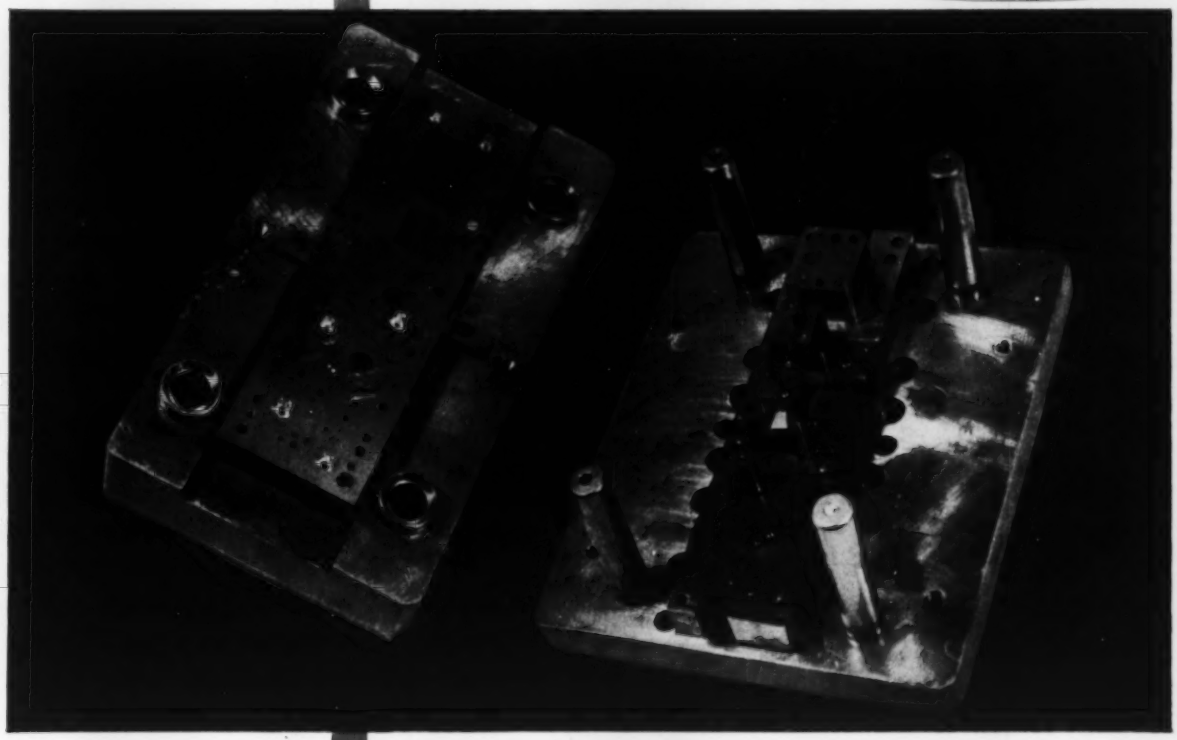
Special MACHINE TOOLS



This HURON Lamination Die Gave Initial Run of 426,000!



Write for BLUE SHEET on HURON

This concise four-page folder gives all needed handling and shop treatment details on Huron. Included is certified laboratory information on physical characteristics, and complete data on forging, annealing, hardening, tempering, etc. *Ask for your copy.*

Address Dept. S-561

LUDLUM HURON high-carbon, high-chrome die steel was the material used in this motor lamination die. Here was the result when the die was run on a 45-ton Bliss press at 210 strokes a minute:

1. Initial run was 426,000 pieces
2. Average run since has been 250,000 pieces
3. Although burr tolerance is .003″, grinding of punch and die between runs has not exceeded .008″

LUDLUM HURON WAS SELECTED because of its known high resistance to wear, especially under heavy pressures, and its excellent non-deforming qualities. Because Huron is an oil-hardening steel and hardens uniformly to a great depth, a consistent production rate after each grind was assured.

There's an A-L Tool Steel that will help solve your cutting, forming or blanking problem. Call our nearest office or distributor today, or write *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pennsylvania.*

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W&D 5157

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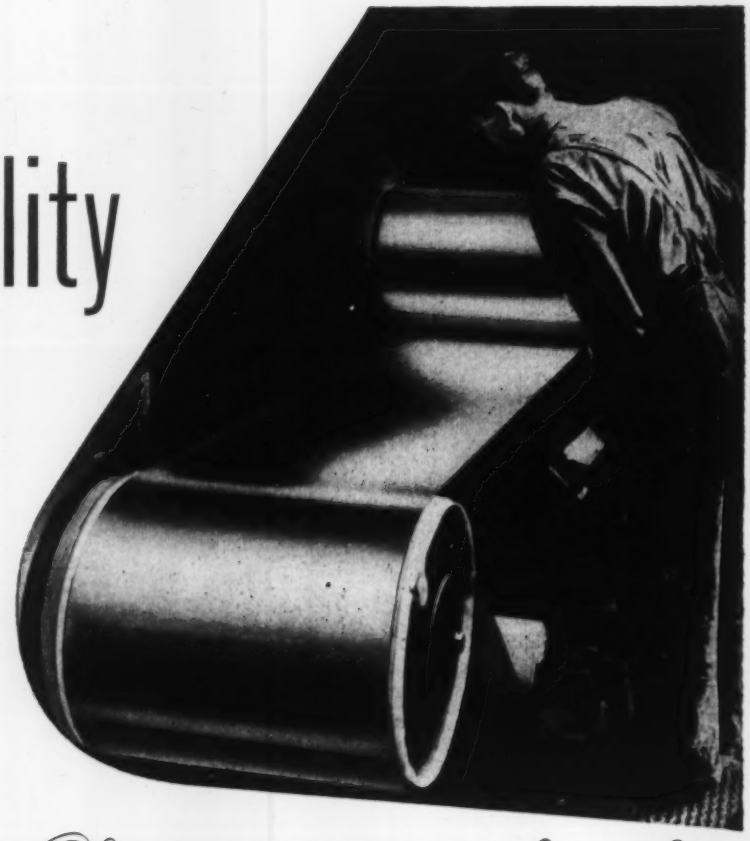

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America's preferred strip steel

The finest rolling equipment in the steel industry works for you when you specify USS Amerstrip. It enables us to supply you a *uniform* finish that exactly meets your specifications. Whether you need a dull finished surface for painting, a bright surface for electroplating, a galvanized or tinned surface for extra corrosion resistance, you can get it in Amerstrip. This wide range of high quality finishes is one reason why USS Amerstrip is more widely used in a greater variety of products than any other strip steel.

Amerstrip comes in a complete range of analyses and tempers in carbon, stainless, and alloy steels . . . in coils or cut lengths . . . with a round or square, natural or rolled edge.

If you have any question about the selection or use of strip steel, write to American Steel & Wire, Room 842, Rockefeller Building, Cleveland 13, Ohio. Our steel specialists will be glad to help you.

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UNITED STATES STEEL

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...all on a $3,000 investment. At Penn Controls, Inc., the former method of staking or riveting with a mechanical press was too slow . . . actually scrapped 376 pieces a day due to variations in size of components.

Now, women operators simply load the six parts of the magnetic switch onto the index table of a 4-ton Denison Multipress. With one smooth hydraulic stroke of the Multipress ram, parts are accurately staked together . . . saving $7,345 a year on scrap reduction alone.

With the same labor, Multipress has nearly doubled production.

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—call CRUCIBLE

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Every piece of REX high speed steel responds uniformly to heat treatment, and gives maximum performance on the job. REX high speed steels possess the best possible combination of maximum red hardness and toughness. That's because Crucible maintains careful metallurgical checks on these steels throughout every step of manufacture. Each piece must measure up to highest quality standards.

It pays to specify REX when you order high speed steels . . . and remember, REX is made only by Crucible.

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Photo courtesy of St. Charles Manufacturing Co.

Shearing 400 items of kitchen and hospital equipment from 10 to 24 gauge sheets, on two nine-hour shifts six days a week, 4 Cincinnati Shears equipped with the Cincinnati Magnetic Sheet Support are highly productive machines in the St. Charles Manufacturing Company shops.

The Cincinnati Magnetic Sheet Support eliminates sag in thin sheets, permits quick, positive gauging, and increases the production of accurate blanks.

Write for Shear catalog S-6.

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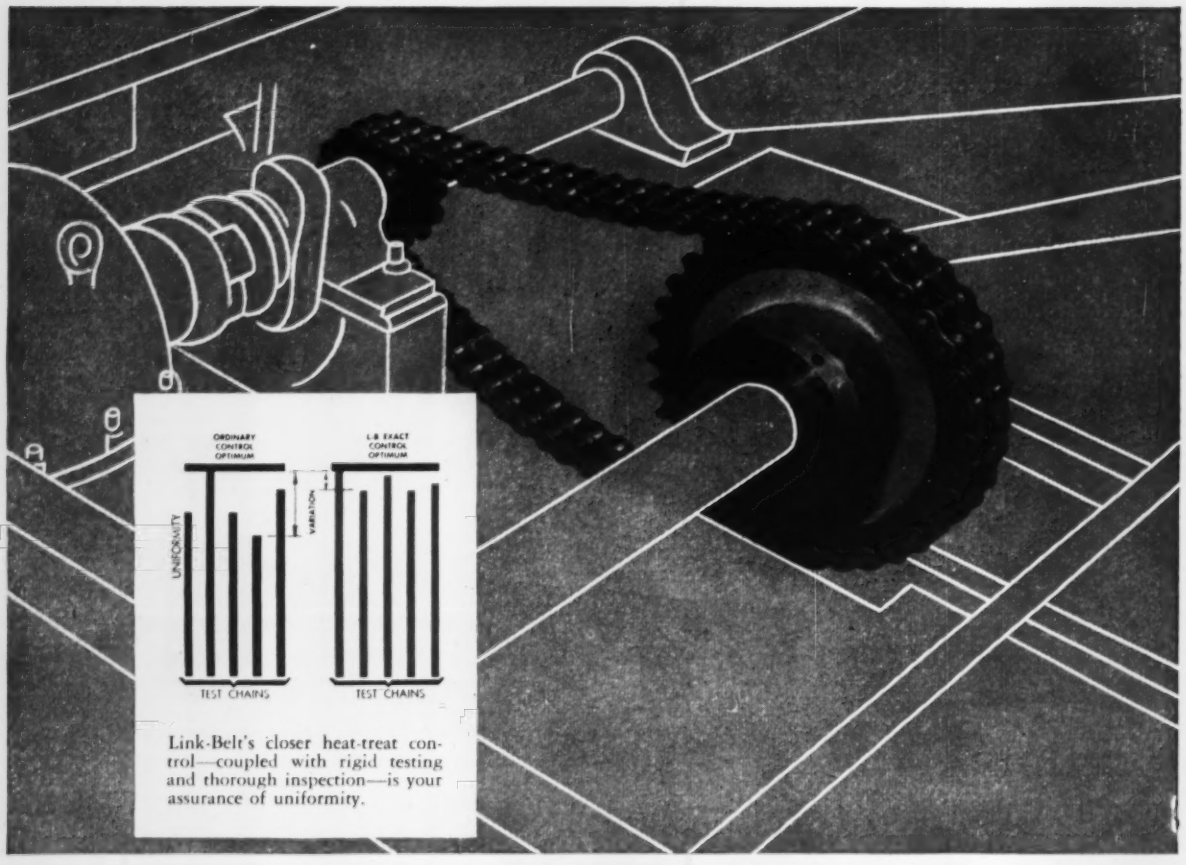
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



Link-Belt's closer heat-treat control—coupled with rigid testing and thorough inspection—is your assurance of uniformity.

Closer heat treat control means longer roller chain life!

But it's only one of many engineering extras you get from LINK-BELT

THE long-life record of Link-Belt Precision Steel Roller Chain is based on more than closer heat treat control. Consider such extra-wear features as shot-peened rollers and lock-type bushings. They're further assurance of Link-Belt's *built-in* extra life.

Link-Belt Roller Chain is available in single or multiple widths, ⅜" through 3" pitch. Double pitch, 1" through 3". For all the facts, call the Link-Belt office or distributor near you today, or write for Data Book No. 2457.

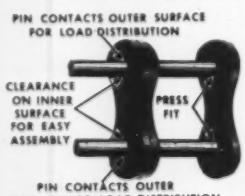
LINK-BELT

ROLLER CHAIN & SPROCKETS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 13.120-A

Don't overlook these other LINK-BELT extras

Shot-peened rollers have extra fatigue life for higher speeds, heavier loads.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PRESS FIT
PIN CONTACTS OUTER SURFACE FOR LOAD DISTRIBUTION

Couple, uncouple multiple-width chains easily.

Lock-type bushings assure free articulation.

CALENDAR
OF MEETINGS

August 16-18, Society of Automotive Engineers Inc.: National West Coast meeting, Hotel Statler, Los Angeles. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

August 19-20, American Management Association: Briefing session on the new tax law, Hotel Statler, New York. Association address: 330 W. 42nd St., New York. Vice president-secretary: James O. Rice.

August 25-27, Western Electronic Show & Convention: Pan Pacific Auditorium and Ambassador hotel, Los Angeles. Business manager: Mal Mobley Jr., 344 N. La Brea Ave., Los Angeles 36.

August 30-September 3, Automotive Electric Association: Annual fall meeting, Vanss Springs hotel, Vanss Springs, Alberta, Canada. Association address: 802 Michigan Bldg., Detroit. Executive secretary: S. W. Potter.

September 1-16, International Electrotechnical Commission: Golden jubilee meeting, University of Pennsylvania, Philadelphia. Information: D. E. Denton, Public Relations Dept., American Standards Association, 70 E. 45th St., New York 17.

September 4-8, Pressed Metal Institute: Annual fall meeting, Manoir Richelieu hotel, Murray Bay, P.Q., Canada. Institute address: 2860 E. 130th St., Cleveland. Managing director: O. B. Werntz.

September 7-9, Industrial Truck Association: Fall meeting, Greenbrier hotel, White Sulphur Springs, W. Va. Association address: Washington Loan & Trust Bldg., Washington 4. Secretary: William Van C. Brandt.

September 7-9, National Fluid Power Association: Fall meeting, Hotel Commodore, New York. Association address: 1618 Orrington Ave., Evanston, Ill. Secretary: Barrett Rogers.

September 8-10, American Society of Mechanical Engineers: Fall meeting, Schroeder hotel, Milwaukee, Wis. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

September 8-10, Porcelain Enamel Institute Inc.: Shop practice forum meeting, Urbana-Lincoln hotel, Urbana, Ill. Institute address: 1346 Connecticut Ave. N.W., Washington 6. Secretary: John C. Oliver.

September 8-10, National Bureau of Standards: Conference on cryogenic engineering, NBS-AEC cryogenic engineering laboratory, Boulder, Colo. Information: M. M. Reynolds, chairman of the conference, NBS Boulder Laboratories, Boulder, Colo.

September 10-11, Metal Powder Association: Fall closed meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

September 11-14, Packaging Machinery Manufacturers Institute: Annual meeting, Grove Park Inn, Asheville, N. C. Institute address: 342 Madison Ave., New York 17. Secretary: Miss Helen L. Stratton.

September 12-15, National Metal Trades Association: Eastern plant management conference, Sagamore hotel, Lake George, N. Y. Association address: 122 S. Michigan Ave., Chicago 3. Secretary: Charles L. Blatchford.

September 12-17, American Chemical Society: Fall meeting, Statler hotel, New York. Society address: 1155—16th St. N. W., Washington 6. Executive secretary: Alden H. Emery.

September 13-14, American Coke & Coal Chemicals Institute: Annual meeting, The Homestead, Hotel Springs, Va. Institute address: 711 14th St. N.W., Washington 5. President: Samuel Weiss.

September 13-15, Allied Railway Supply Association: Annual meeting and exhibit, Hotel Sherman, Chicago. Association address: 1200 W. Chase Ave., Chicago 26. Secretary: C. F. Weil.

September 13-16, Society of Automotive Engineers Inc.: National tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

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Add life to your product's paint finish . . . with

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Paintbond's fine-grained crystalline structure gives added life to paint finishes in two ways. First, Paintbond provides secure anchorage—literally locks paint to metal surfaces. It also stops corrosion in its tracks. If a painted surface gets scratched Paintbond minimizes the damage—confines rust to the scratched area—puts an end to paint flaking and peeling.

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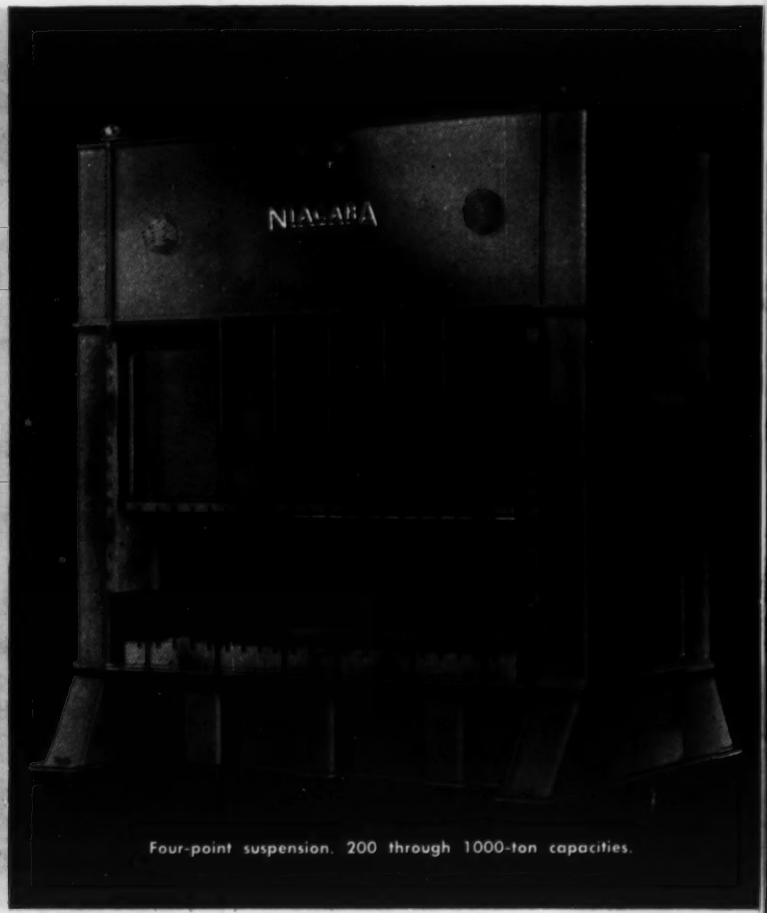
One-point suspension. 100 through 1000-ton capacities.



Four-point suspension. 200 through 1000-ton capacities.

ECCENTRIC DRIVE DELIVERS GREATER TORQUE WITH LESS DEFLECTION

In Niagara Series SE Presses, the eccentric is an integral part of the main gear (or gears) which rotates on a stationary pin rigidly supported in the crown, close to the point at which the pressure is exerted. Serving merely as a pivot, the pin carries no torsional load and relatively little bending load. Net result: Niagara's eccentric gear design can deliver greater torque with less deflection than other types of construction.

RUGGED, RIGID, ALL-STEEL FRAMES PROVIDE GREATER ACCURACY, LONGER DIE LIFE

Frames are rugged, all-steel, four-piece, tie-rod construction of great strength and rigidity, stress relieved in a furnace and thoroughly grit-blasted before machining. Each frame size has been scientifically tested for deflection to meet Niagara standards — the most exacting in the industry.

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Most of the weight of the Niagara clutch continues to rotate with the flywheel. Only the drive shaft and driving plate start and stop with each cycle. The resulting low weight and inertia of the parts, picked up during clutch engagement, greatly reduce heat and wear. As the clutch rotates, it acts as a centrifugal blower, providing positive ventilation. Plates automatically compensate for normal wear, with no adjustment necessary.

MODERN, STREAMLINED DESIGN EMPHASIZES COMPACTNESS

The entire driving assembly is neatly housed in the crown. There is no exposed, overhanging flywheel, clutch, brake, shaft nor motor in the rear of the press to obstruct crane service, block light, throw grease or consume space unnecessarily.

LINE OF METALWORKING CHAMPIONS

drawing, punching and blanking work

Two-point suspension. 200 through 1000-ton capacities.

Without equal in engineering design, performance and stamina, this great new line of Niagara Straight Side Eccentric Geared Presses is every inch a champion. It is an outstanding example of the advanced thinking that has made Niagara the pace-setter among builders of metal working machines for 75 years.

Masterfully engineered and ruggedly constructed to handle a tremendous variety of work, the new Niagara SE Series is the most practical and dependable press line built for:

- Work requiring large die areas.
- Heavy tonnage demands.
- Long stroke, deep drawing jobs where work is engaged high up on the stroke.
- Bottom-of-stroke blanking and punching.

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Make a feature-by-feature appraisal of what these great new presses can do for you. Write for newly published, illustrated Bulletin 66. It will be forwarded promptly without obligation.

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Compactly and conveniently arranged on a master panel, Niagara controls are instantly accessible for fingertip direction of every press operation: starting, slide adjusting, jogging, die tryouts, running and stopping. The latest safety devices provide maximum protection for die setter, operator and the press itself. Nothing has been overlooked. Trial runs assure that all controls are in proper working order before each Niagara press leaves the plant.

NIAGARA

STRAIGHT SIDE ECCENTRIC GEARED PRESSES

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

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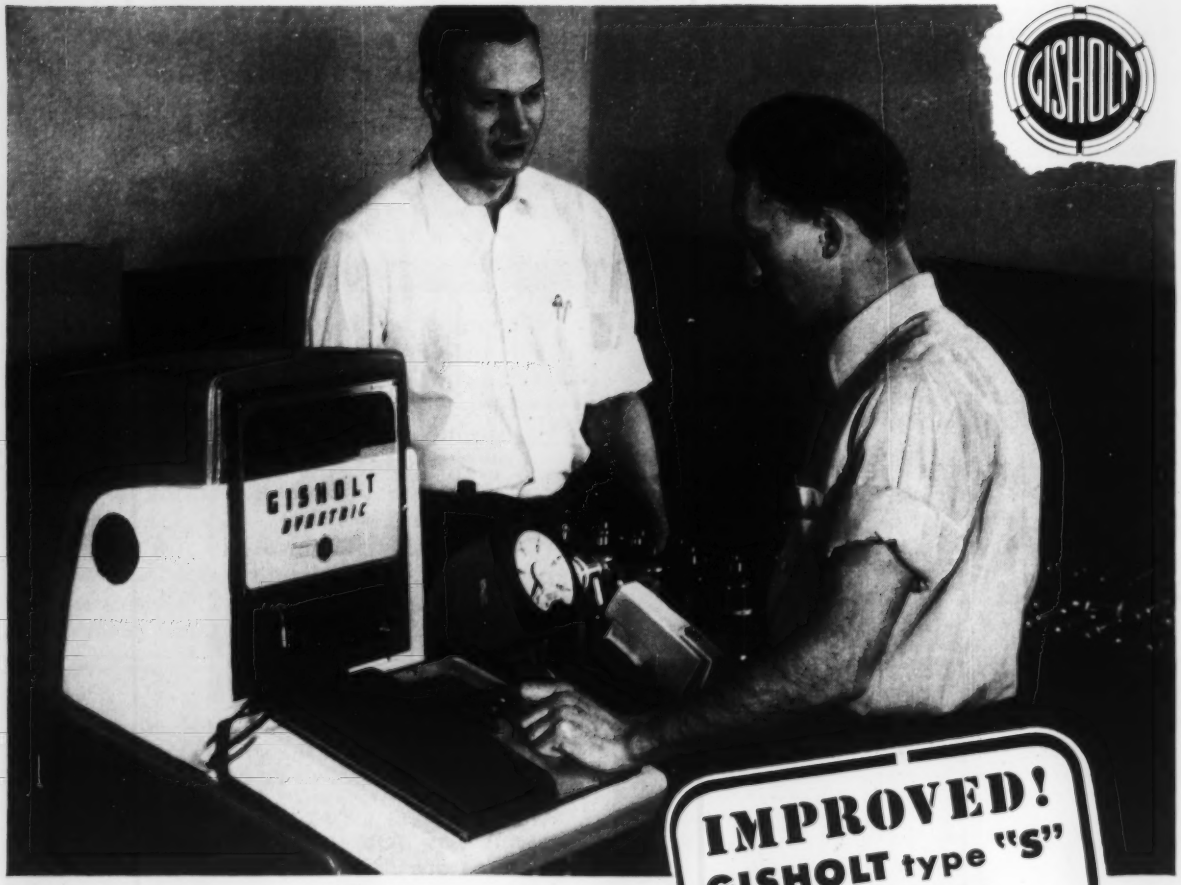

To Give Increased Efficiency... to cut costs!

Here's the happy combination—the time-proved features of earlier Type "S" Balancers plus nine great new features which years of production experience have proved desirable. Among these latest improvements are...

- Location of unbalance is by highly efficient, yet inexpensive stroboscopic lamp.
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If balancing is important in your operations, get the facts about these improved DYNETRIC Type "S" Balancers—available in both horizontal and vertical types for handling parts up to several hundred pounds.

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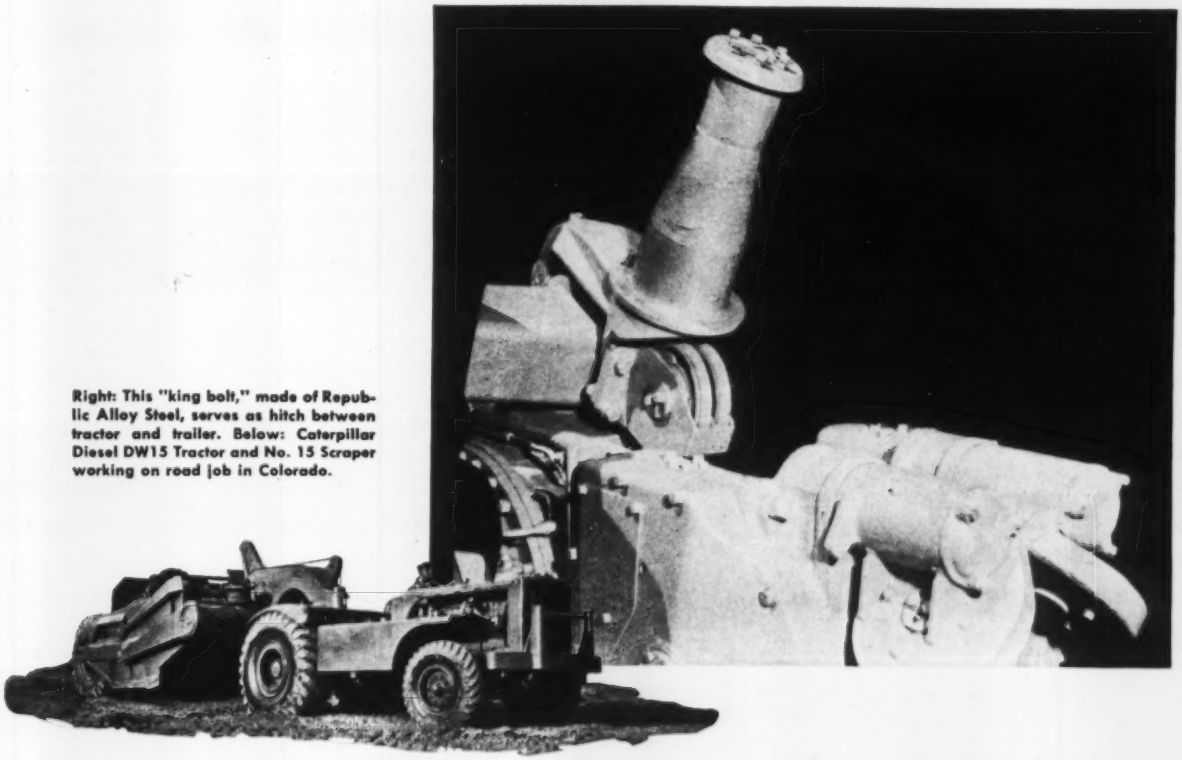

Right: This "king bolt," made of Republic Alloy Steel, serves as hitch between tractor and trailer. Below: Caterpillar Diesel DW15 Tractor and No. 15 Scraper working on road job in Colorado.

How Republic Alloy Steels Help CATERPILLAR®

Take the "king bolt." It's the link between tractor and scraper or wagon. It takes all the pull, the bumps, and the shocks when a tractor drags earth-moving or other heavy equipment over uneven ground. It has to be tough.

Caterpillar uses a specific Republic Alloy Steel for this part on its DW15 tractor. And for other parts as well, many of which are not as easy to spot. But all of which are important.

Republic has been supplying Caterpillar with alloy steels for a good portion of the 50 years that track-type machines have been roaming and moving the earth. More than this, Republic metallurgists have helped Caterpillar use these steels to best advantage.

This year is Caterpillar's 50th Anniversary in the manufacture of crawler tractors. And Republic is glad to congratulate a pioneer. You see, Republic pioneered the wide use of alloy steels. And we're still helping manufacturers use these steels profitably.

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Alloy Steel Division • *Massillon, Ohio*
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Export Department: Chrysler Building, New York 17, N. Y.

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Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Bars, Wire, Pig Iron, Steel and Plastic Pipe, Bolts and Nuts, Tubing

SLICKEST TUBE DRAW COMPOUND YET!

For steel, brass, copper...

SHELL CALMA COMPOUND K, a new product of Shell Research, is the economical answer to trouble-free tube drawing in both plug-draws and die-sink operations on steel, copper, brass and aluminum tubing. It remains stable for long periods in high bulk temperature operations.

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CHECK ITS ODOR.. CHECK ITS LUBRICITY... CHECK ITS VERSATILITY

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SHELL

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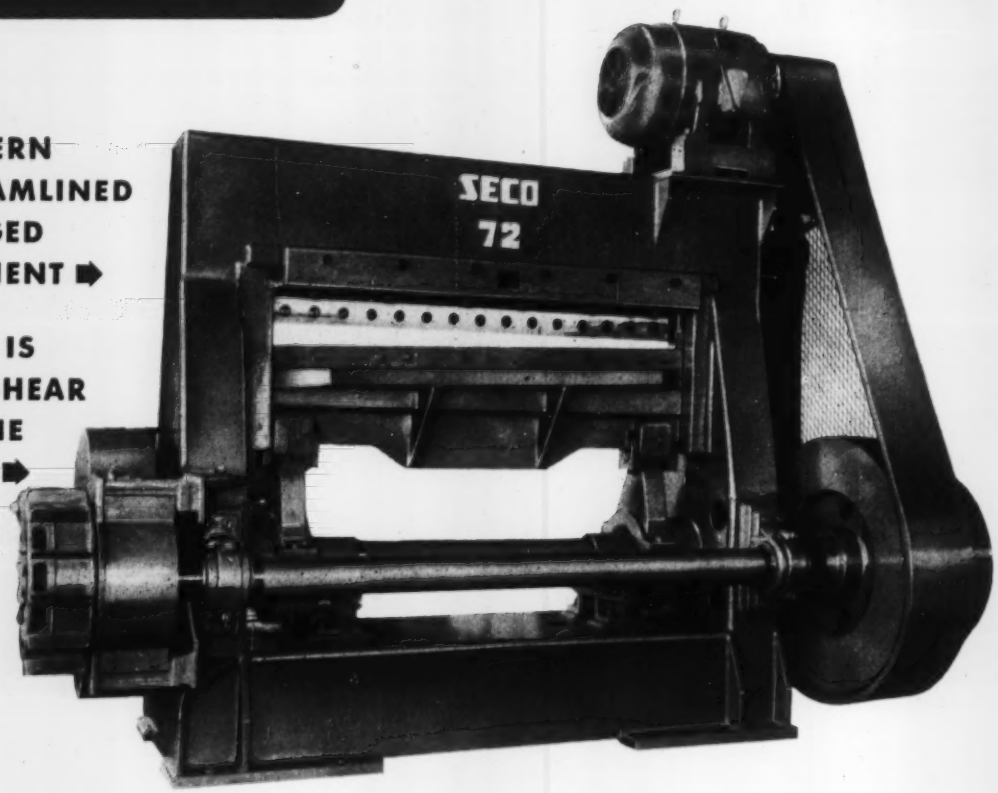
SECO 72" UP-CUT SHEAR

MODERN
STREAMLINED
RUGGED
EFFICIENT ➡

HERE IS
THE SHEAR
OF THE
YEAR ➡



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Coil Up-Enders • Scrap Ballers

This new SECO 72" Up-Cut Shear is designed and built for rugged, heavy duty service in (a) Leveling and shearing lines (b) In coil build-up lines for squaring coil ends prior to welding (c) In processing lines where shearing is required.

Shearing capacity is ¼" stainless, or ⅜" low carbon steel up to 72" wide...cutting in lengths from 2 feet or any increment up to 16 feet or longer...shearing speed 60 cuts per minute. The drive consists of a 20 H. P. motor, multiple V-belts, Fawick Airflex clutch with a heavy fly wheel, Airflex brake and rotary limit switch.

Features of the SECO 72" Up-Cut Shear are: one piece frame, rigid box section of all steel welded construction; anti-friction bearings on drive shaft; knuckle-joint plus pin for connecting pitman to lower ram; adjustable bolster for upper knife, permitting easy and quick clearance setting between knives with 4 cutting edges.

A modification of this shear is our "Tri-Cut" Shear, handling three strands side by side, with individual shearing selection.

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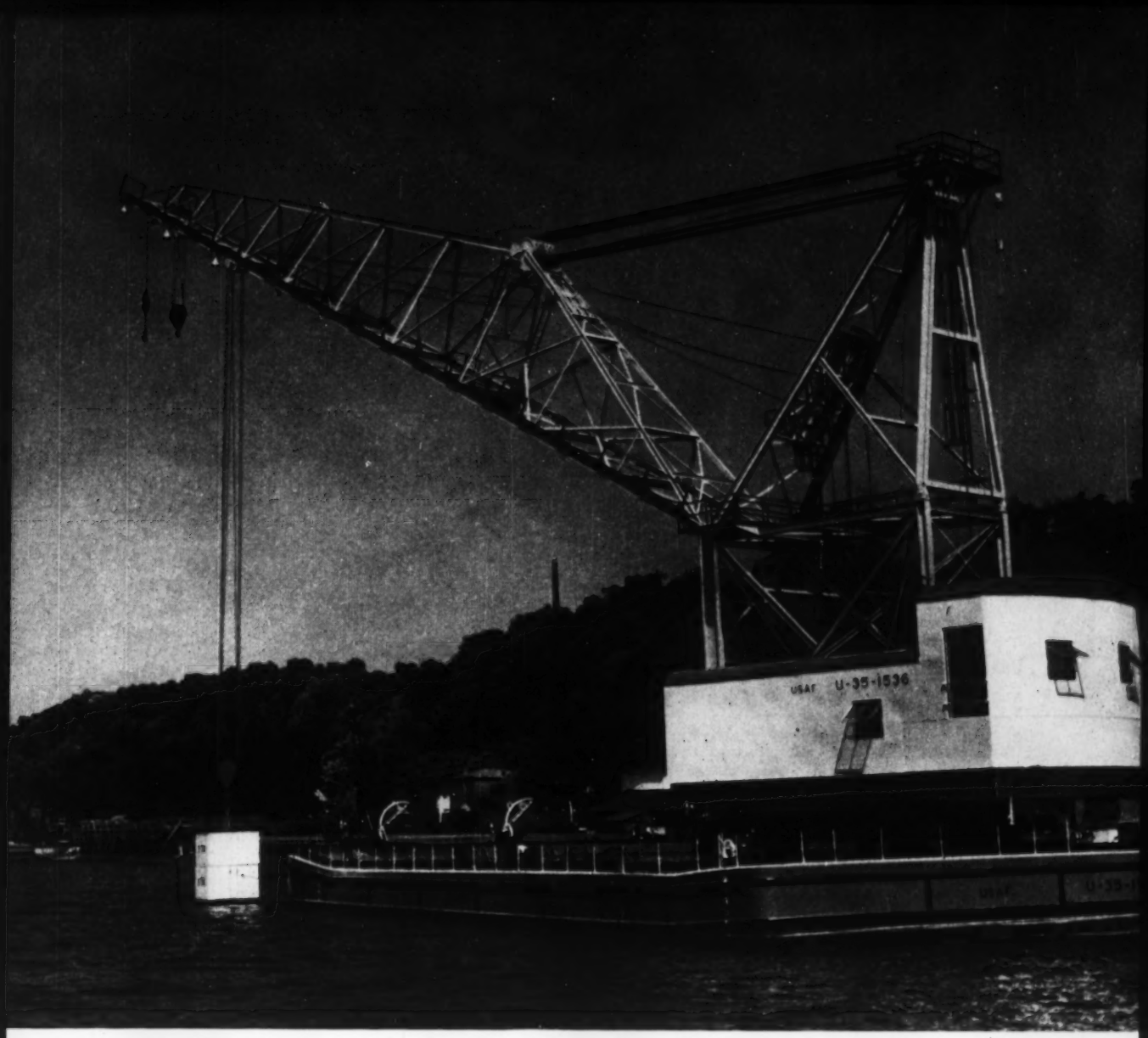
SECO



Big new weight-lifter signs up with Air Force

Biggest crane ever built for the U.S. Air Force is this floating heavyweight with a 50-ton design capacity.

Shown here flexing its muscles on a 56-ton load at 115 ft. radius during performance trials, it towers 100 feet high, has 145-foot boom. It's one of six floating cranes designed and built by Barium's Wiley Manufacturing Co., Port Deposit, Md., under supervision of the Navy's Bureau of Yards and Docks.

Point we'd like to make, though, is the way four separate Barium companies meshed operations to produce this job. Steel plate was supplied by Central Iron & Steel, Harrisburg, Pa.; structurals came from Phoenix Iron & Steel, Phoenixville, Pa.; forged shafts were turned out by Industrial Forge & Steel in Canton, O.; while Wiley engineered, fabricated and constructed both crane and 144-ft. barge.

That's spelling out in detail what we mean by Barium's "integrated operations". It means a lot on the policy level, of course, but it really pays off for Barium's customers down on the level where things get done. Not all our customers order giant floating cranes, we'll admit, but you get the same kind of service from this 16-company team whether you buy tiny springs or railroad bridges.

Remember—to Barium your *entire* order is important. No danger of any component being delayed—Barium keeps a sharp eye on all processing. This means faster handling, less paper work, and pinpointed responsibility. "The Barium Story" fills in details. Write for a copy. BARIUM STEEL CORPORATION, 25 Broad St., New York City 4.

16 INTEGRATED COMPANIES
BARIUM
STEEL CORPORATION
WORKING IN STEEL, ALUMINUM, MAGNESIUM, FIBERGLASS

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IT WORKS WONDERS IN MATERIALS HANDLING-

300 to 400% increase in efficiency

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One Truck-Mounted Dempster-Dumpster Handles Scores of Containers... All Designs... All Sizes

With the Dempster-Dumpster System, one truck-mounted Dempster-Dumpster accomplishes more than several conventional dump trucks. You eliminate trucks standing idle. You eliminate re-handling of materials. You eliminate loading crews. You increase efficiency, sanitation and good plantkeeping with this Dempster-Dumpster System—the lowest cost method of bulk materials handling ever devised.

It's like having one truck with scores of bodies. One truck-mounted Dempster-Dumpster serves scores of detachable containers built in capacities up to 15 cu. yds. Each is designed to suit the materials to be handled—be they solids, liquids, dust, bulky, light or heavy. You simply place these containers at convenient materials accumulation points outside or inside buildings. As each is loaded, it is picked up, hauled and dumped (or load set down intact). Entire operation is handled by hydraulic controls in cab by only one man, the driver.

The list of manufacturers using the Dempster-Dumpster equipment reads like the "Who's Who Among the Nation's Leading Manufacturers". We mention this simply to point out that dozens of the nation's oldest and most successful firms use the Dempster-Dumpster System because of its efficiency and tremendous savings. Write to us now for complete information. Manufactured exclusively by Dempster Brothers, Inc.

Representatives in principal cities throughout the United States, Canada and foreign countries. There's one near by to serve you promptly.

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Do YOU Know What WE Know About Speeds and Feeds?

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This new report from the continuing Monarch machinability research program is a valuable tool that you'll want to put in the appropriate hands in your organization without delay. A copy is yours, without cost, as a Monarch service.

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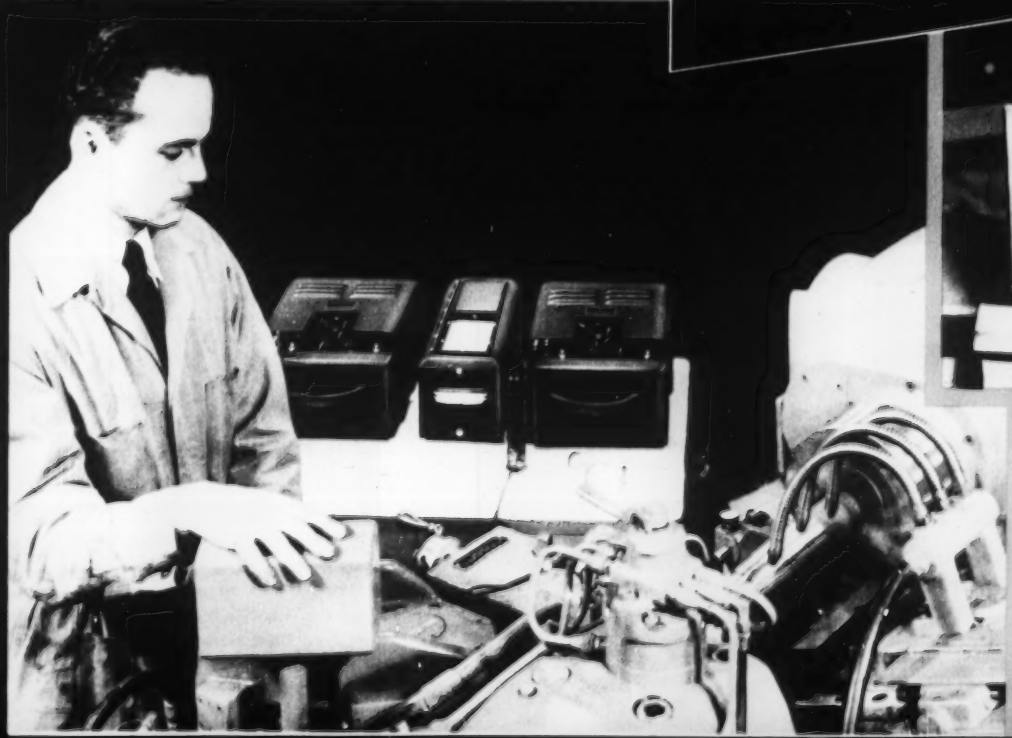
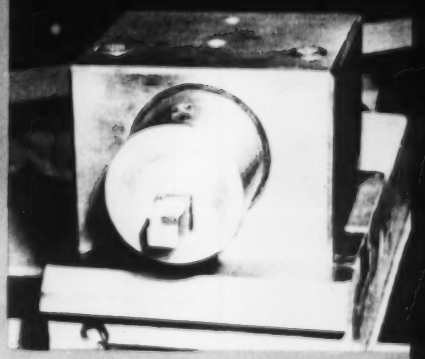
TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

See Next Page For Details



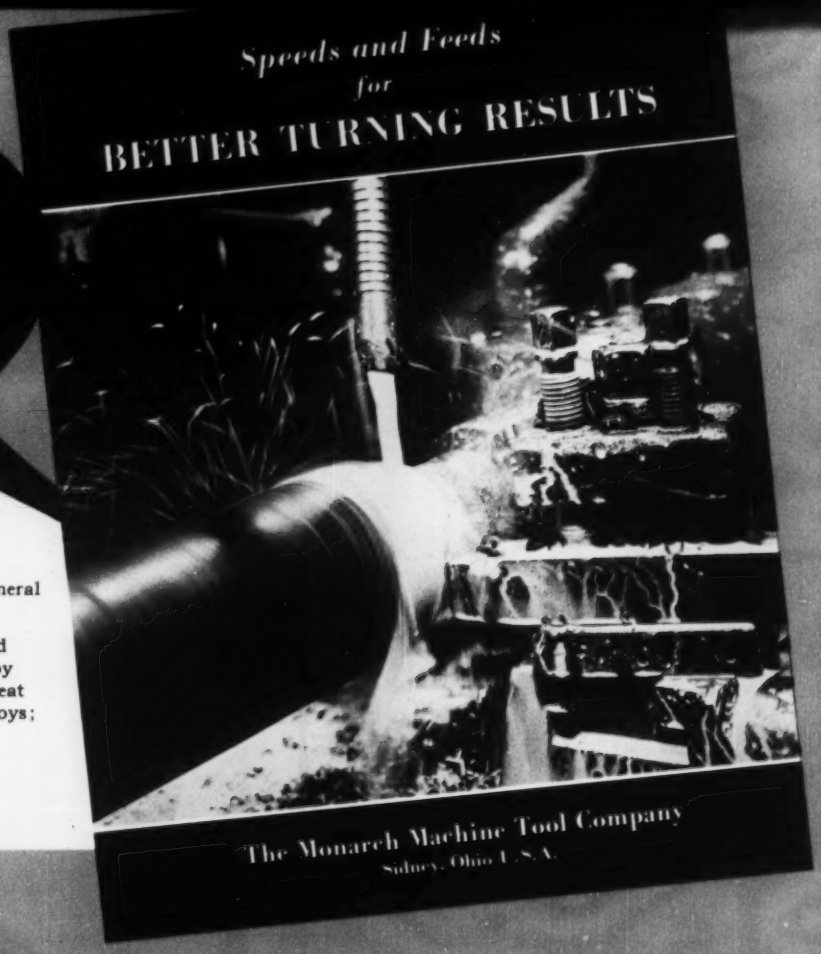


▲ Close-up of Dynamometer Used in Monarch Tests.

◀ Monarch Machinability Test Lathe in Action, With Typical Instrumentation.

The last word in turning—

Fresh off the Press!



PARTIAL LIST OF CONTENTS

SUBJECTS—Tool Angles; Machinability Ratings; Speed and Feed Charts; General Practice; Coolant; Horsepower.

MATERIALS—These subjects are discussed as pertinent to: Plain and Carbon Alloy Steels; Tool Steels; Stainless Steels; Heat Resistant Alloys; Cast Iron; Nickel Alloys; Copper Alloys; Aluminum Alloys; Magnesium Alloys; Plastics.

TECHNICAL CUTTING DATA—TABLES

WHAT IT IS. This book tells *you* what our studies tell *us* about the basic facts of turning. No complete technical operations handbook, its primary purpose is to serve as your guide in establishing optimum machining conditions. Much of this information is original and available nowhere else. What information has been distilled from other sources has been re-evaluated from our own findings under down-to-earth shop conditions.

ITS SOURCE. The Continuing Monarch Machinability Research Program.

This project has been in operation for some years, under the supervision of full-time recognized specialists drawing on all Monarch facilities (see preceding page). Its scope consists of the continuing evaluation of *all machining factors* which have a bearing on getting the maximum practical output from carbide cutting tools.

ITS PURPOSE. With its facts, this booklet will guide you to better, more profitable turning practice, regardless of your equipment. Or, with Monarch lathes featuring single point turning and tracer controls, you'll get *from* your lathe all the productivity we build *into* it—and that's optimum productivity . . . *The Monarch Machine Tool Company, Sidney, Ohio.*

To Get Your Free Copy of the Monarch *Speeds and Feeds* Booklet, FILL OUT THIS COUPON and attach it to your business letterhead.

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio

Gentlemen: I would like a copy of your Speeds and Feeds Booklet. Please send it to me without obligation.

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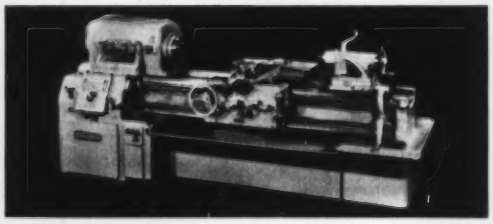
FOR A GOOD TURN FASTER . . . TURN TO MONARCH



See This New Monarch Line—Series 61. First and only complete lathe line with apron-controlled 4-way power rapid traverse.

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Feature space saving, longer life Duti-Rated Lifetime Gears. Available in double and triple reductions with ratios from 5 to 1, up to 238 to 1; capacities range up to 200 h.p.

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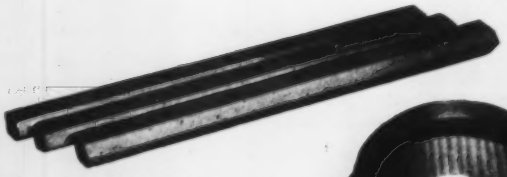
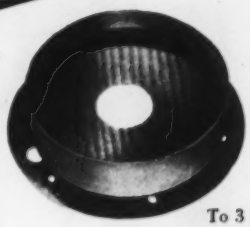
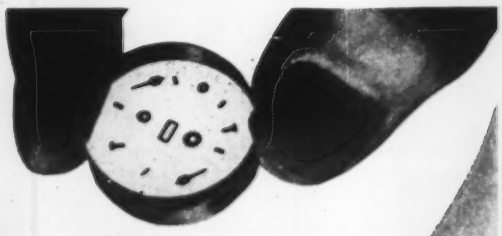


Hardened steel machine tool ways, 2½" x 3½" x 50", ground on 6 sides, flat within .001" with surface finish of 5 micro-inches—*5 times faster than other methods!*

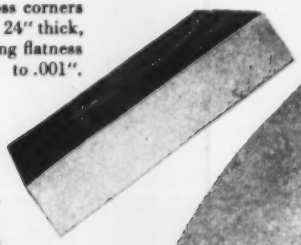


To 3 micro-inches and flat within *one* light band.

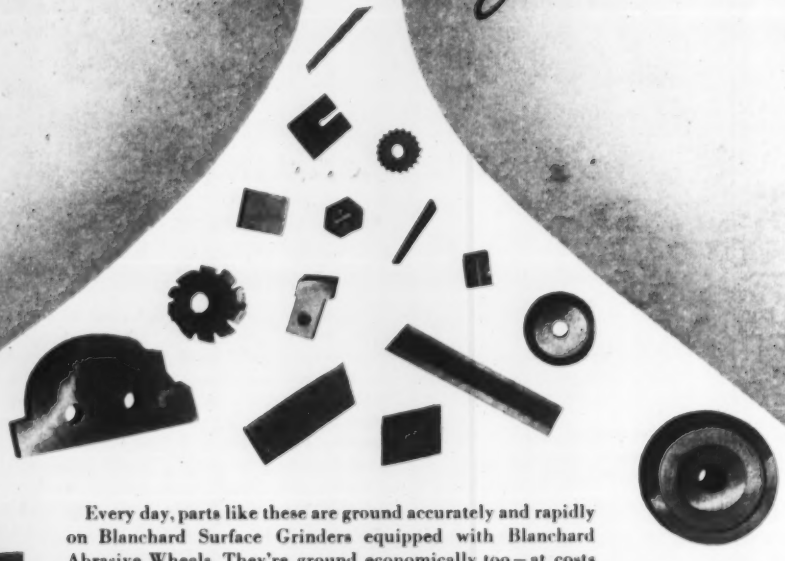


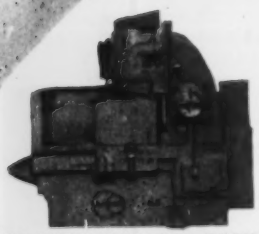
Tiny watch gears, pinions and ruby bearings—flat and parallel—to a dimension tolerance of .0002".

Die plates, 84" across corners and perhaps 24" thick, holding flatness to .001".



"Specs" like these call for Blanchard





NO. 18 BLANCHARD SURFACE GRINDER

Every day, parts like these are ground accurately and rapidly on Blanchard Surface Grinders equipped with Blanchard Abrasive Wheels. They're ground economically too—at costs which help you set competitive prices.

Send a sample of your parts for free test grinding and recommendations.

Send for your free copies of "Work Done on the Blanchard", fourth edition, and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

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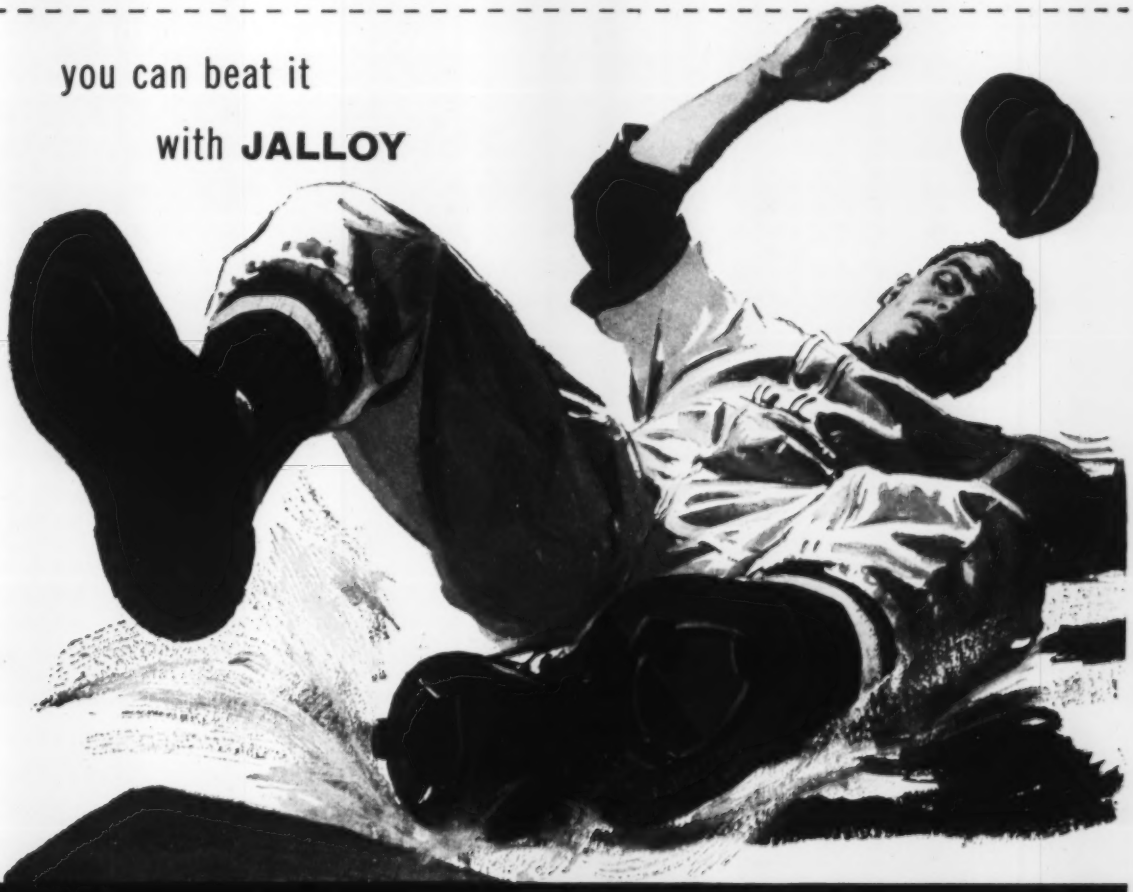
FACING A TOUGH PROPOSITION?

you can beat it

with **JALLOY**



J&L JALLOY HEAT-TREATED PLATE BEATS WEAR DUE TO ABRASION

J&L Jalloy Heat-Treated Plate is the special purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded.

Jalloy is available in three grades to meet various service requirements.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 404, Pittsburgh 30, Pa.

☐ Please mail complete data concerning Jalloy.
☐ Please have your representative call.

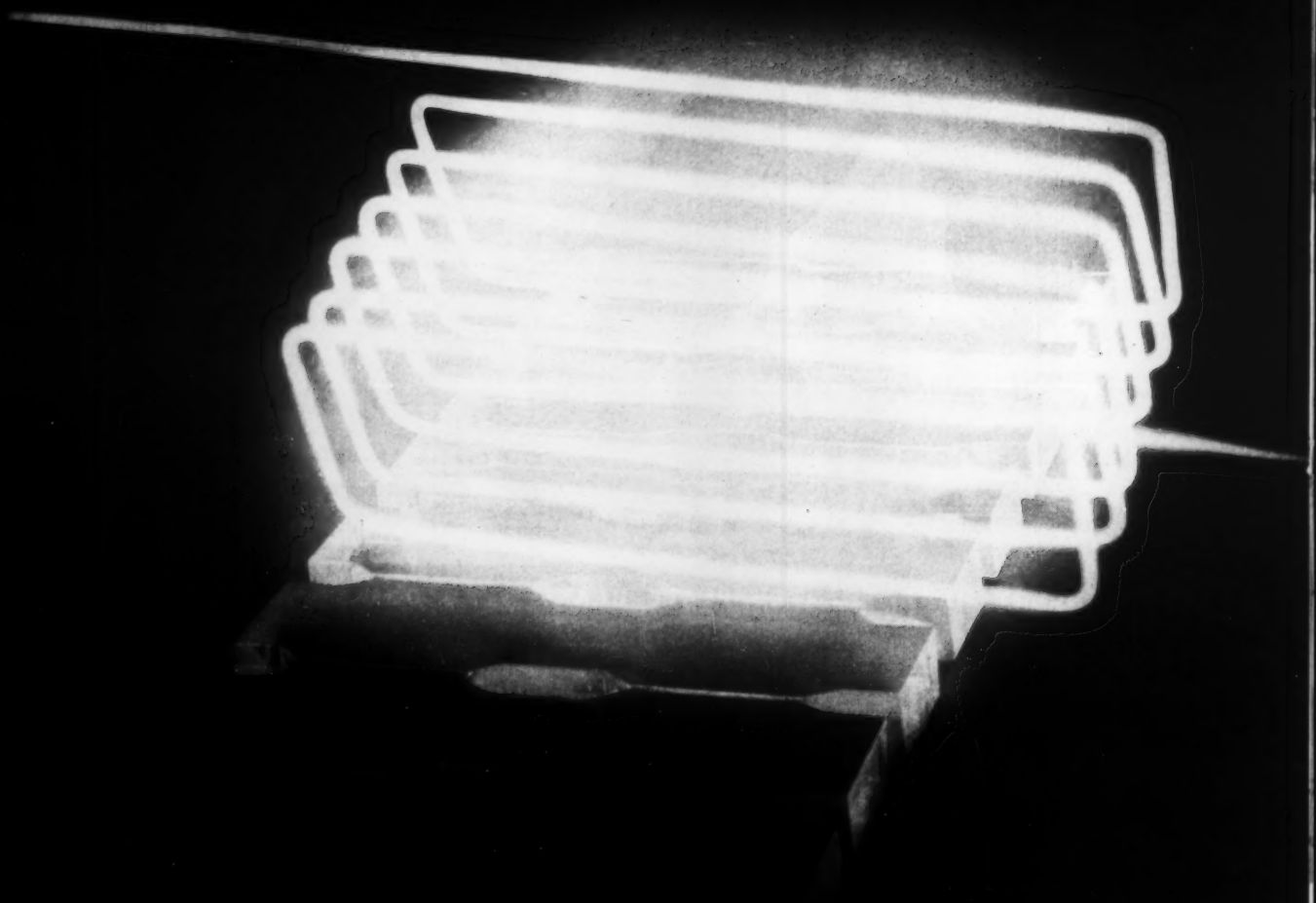
Name_____ Title_____

Company_____

Address_____

_____

ANOTHER WESTINGHOUSE FIRST IN INDUCTION HEATING FOR FORGING . .



New Westinghouse coil design handles irregular shapes, puts forging operations into your production line

Another successfully applied Westinghouse development, this new technique brings the cost and production benefits of induction heating to a larger variety of forging operations than ever before.

Proved in actual service, this design solves the problems of heating a workpiece having an irregular cross section. It combines the *sideways feeding* of the workpiece with a specially developed inductor coil, and offers these outstanding advantages:

- Less space required—short inductor coil accommodates many workpieces side by side during heating cycle, yielding savings in production-line length and floor space.
- Heating uniformity—control of current flow in workpiece minimizes variations in heating normally caused by irregular contour.
- Greater efficiency—less exposed workpiece area means less radiation loss. Better coupling is possible on irregular-shaped workpieces.

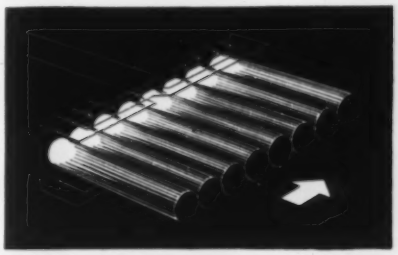
This new process—as well as additional ones shown at right—offers greatly increased opportunity to cut costs, speed production and improve quality in your forging operation.

Put Westinghouse induction heating to work for you . . . NOW!

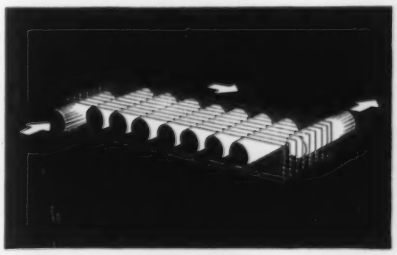
Whether your forging involves regular or irregular shapes, selective or over-all heating, Westinghouse can engineer and build the right and *complete* setup to solve your production problems. Call your local representative or write: Westinghouse Electric Corporation, Induction Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland. J-02288

YOU CAN BE SURE...IF IT'S Westinghouse

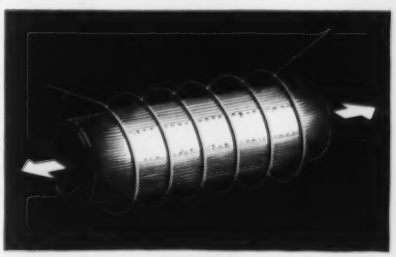
•Skilled application backed by long experience is the key factor in Westinghouse ability to make induction heating handle your individual problems. Below are three methods often used:



Lateral Feed—Bonnet Coil—Typical application: Heat 2 inches of the end of a ⅝-inch machine bolt blank to forging temperature at a production rate of 1750 pieces per hour. Adaptable to wide variety of shapes and sizes and "in-line" production.



Traverse Feed—In-Line Coil—Typical application: Through heat to forging temperature a 1 7/16-inch diameter, 13-inch long billet at a rate of 900 billets per hour. Gives maximum efficiency in heating long workpieces in greatly reduced floor space.



Coaxial Feed—In-Line Coil—Typical application: Through heat to forging temperature a 3¾-inch long, 2½-inch diameter billet at a rate of 1440 billets per hour. After heating, piece may be retracted, or pushed straight through coil for "in-line" production.

INDUCTION HEATING FOR

HARDENING • JOINING • ANNEALING

FORGING • HEAT-TREATING

modernizing?

give new equipment the instrumentation it deserves

WHEN you're planning to install new process equipment, plan to take advantage of the full potential of modern methods of measurement and control. It's the sure way to get top value for your modernization investment . . . for the improvements in production economy, quality and versatility possible with today's new process equipment depend increasingly on control instrumentation.

Here are some specific suggestions for your own modernization plans:

New equipment should be designed for control. Instrumentation is not merely a necessary appendage. It's a vital, integrated part of the process itself. Control design goes hand in hand with process design. Honeywell's experienced application engineers will be glad to cooperate with your own staff or your consulting firm, to recommend ways to obtain the full benefit of modern instrumentation.

Each instrument should fit its function. This may seem obvious—but all too often, instrumentation has been stretched or squeezed to fit the application. In Honeywell's exceptionally wide line, you'll find instrumentation with exactly the right performance . . . at the right cost . . . for your process.

A talk with your nearby Honeywell field engineer will give you a detailed picture of what instrumentation can mean in your modernization program. Call him today . . . he's as near as your phone.

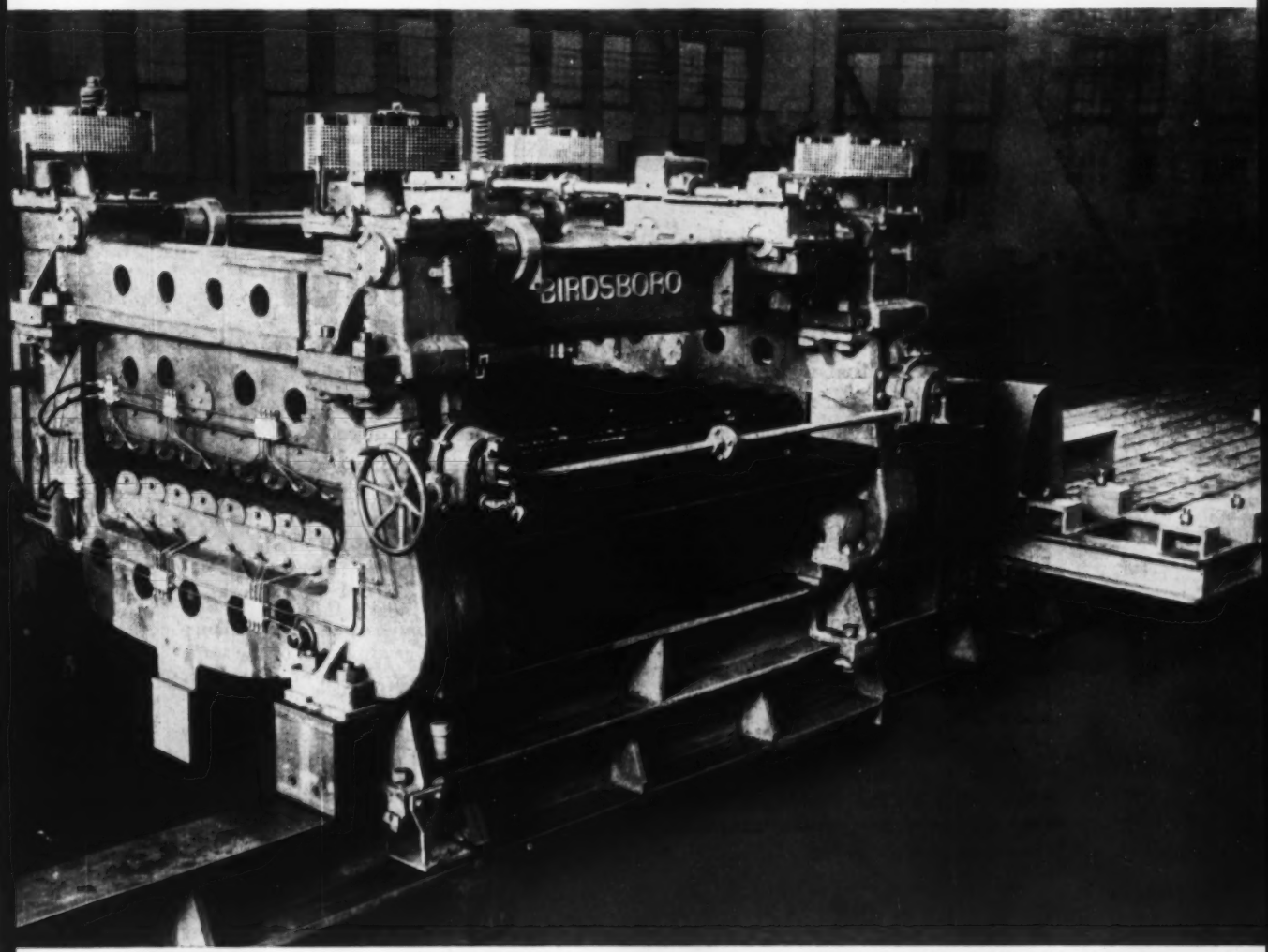
MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

Keeps leveling costs *on the level*...



Leveling machine for hot, mild steel ¼" to ⅝" x 100" wide.

BIRDSBORO Plate Leveler

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
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STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

If you think that high costs are a "necessary evil" on your leveling jobs, investigate the cost-saving advantages of smooth running, maintenance-free BIRDSBORO precision levelers.

There's a BIRDSBORO Leveling Machine designed to give you maximum results at minimum cost, whether your operations include leveling of hot or cold, heavy or light plate. BIRDSBORO engineers also have the diversified experience and know-how to design, engineer and build special levelers to meet your specific requirements.

Put BIRDSBORO engineers to work on your application . . . and keep leveling costs "on the level".

BB-11-54

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

How to choose your steel supplier

Now that we are again in a period of plentiful steel supply, production and fabricating departments can again place first emphasis on higher standards of materials and service. And buyers can choose their suppliers on the basis of character and ability to serve. With this in mind, the following check list may prove helpful.

FIRST, on the character and capacity of the supplier:

☐ Is the supplier a good dependable company with a wide range of steels actually in stock so I can take full advantage of quantity differentials and save time in ordering and other office details?

☐ Am I establishing a business relationship with a company which will be able and willing to supply me with steel at fair prices next month or next year—even if demand should again exceed supply?

☐ Can I return material if it has not been processed and I find that I can't use it?

☐ Can I count on the supplier to settle any reasonable difference of opinion to my satisfaction? Is the supplier customer-minded?

☐ Does the supplier have, not only the interest, but also the ability to carry my account in times of national stress or possible financial difficulty?

SECOND, concerning the material:

☐ Is the steel of *known, uniform quality* so that I can depend on good performance and can be sure of getting steel of the same uniform quality next month or next year?

☐ Is the steel accurate as to size or gauge so that no time is lost in extra processing? Is scrap minimized or eliminated?

☐ Is the steel in good condition? Has it been carefully stored, handled and shipped so that it will arrive ready for use?

THIRD, concerning the service:

☐ Can I depend on clean accurate cutting so that the steel will be immediately available for use without further cutting or preparation?

☐ Can I be sure of correct weight?

☐ Will the steel be delivered when promised so I will get it when I need it, even on very short notice?

No source is perfect, and we certainly do not pose as such. However, we have been serving industry—with good sound steel from stock at fair prices—for over one hundred years. And we have been working with our customers through the years in many other ways from helping with finances to solving problems of fabrication and inventory control.

And it goes without saying—we stand ready to serve *you* well whenever you call.

Principal products: Bars, structurals, plates, sheets, tubing, alloys, stainless, reinforcing, machinery & tools, etc.

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JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL
August 16, 1954

Metalworking Outlook

When Merger Is a Bargain

Officials of Youngstown Sheet & Tube Co. and Bethlehem Steel Corp. have been making joint tours of each other's plants so they'll have more information for the merger talks. There are many reasons why Bethlehem is interested in the deal (p. 53,) but one is a matter of money. Youngstown has 3,350,000 shares of common stock. At a price of $60 the market value is $201 million. The company has an ingot capacity of 5.5 million tons. It would cost about $300 a ton to replace that capacity, or $1650 million. If Bethlehem can get Youngstown at anything like $60 a share, it will have acquired 5.5 million tons of capacity at a saving of more than $1 billion over what it would cost to build such facilities.

Record Home Building in 1955?

Some builders predict that the new Federal Housing Act will enable a record 1.4 million new homes to be started in 1955. Already this year we are building at the annual rate of 1.2 million houses. Some 1,103,800 nonfarm dwellings were started in 1953, 1,127,000 in 1952, 1,091,300 in 1951 and 1,396,000 in 1950.

Steel Exports: Shot in the Arm

Some Pittsburgh steelmakers expect to improve their export sales and railroads hope to recover freight business as a result of lower rates on shipping steel for export which went into effect Aug. 10. The reduction averages about 8 cents per 100 pounds from inland steelmaking cities to Atlantic coast ports. Coinciding with railroads' action, U. S. Steel Export Co. is cutting export base prices up to 20 cents per 100 pounds on some items. Steel exports have been slumping seriously. Overseas shipments of finished products last year hit 3.1 million tons, 26 per cent less than in 1952.

Inland Waterways Haul More

Growing competition by inland waterways in hauling steel destined for export was a big reason for the railroads' freight cut. One producer says shipment by barge from Pittsburgh to New Orleans for European export was cheaper than rail shipment to New York, under the old rates, and subsequent export to Europe. Inland waterway carriers hauled 62 billion ton-miles of all kinds of freight between cities in 1951, 64 billion in 1952 and 75 billion in 1953. Their percentage of total intercity haulage jumped from 5.6 in 1951, to 5.9 in 1952 and 6.7 in 1953.

Will Steelworkers Leave CIO?

Many CIO officials in Ohio, Michigan and Illinois are saying privately that they expect David McDonald and his United Steelworkers of America to pull out soon from the congress. USA's new wage contracts with the steel industry were rewritten to delete any references to the CIO. And Mr.

Technical Outlook—p. 95 Market Outlook—p. 139

Metalworking Outlook

McDonald is reportedly toying with the idea of asking the steelworkers' convention in September to remove the CIO constitutional requirement. If USA does pull out, it will mean, among other things, the loss of $1 million annually in CIO dues.

Brass Mills Seek a Remedy

The brass mill industry plans a big campaign to gain business. The decision springs from studies which show that in 15 consuming categories the use of copper from 1947 through the first quarter of 1953 had increased only 31.6 per cent. In those same categories in the same period the use of aluminum gained by 86.7 per cent.

Defense Spending Picks Up

Defense spending is picking up and should stabilize at about $3-billion-a-month rate for the next two or three years. The Air Force will spend about half that money, the Navy will contract for about one-third and the Army will spend the rest. It's not enough to start a boom, but it will help business hold its own.

Needed: Better U.S. Statistics

Better and faster government statistics are needed as tools in planning business expansion, says the Joint Congressional Committee on the Economic Report. It charges Congress has been too niggardly in appropriating funds for that purpose.

Straws in the Wind

Laclede-Christy Co. "is not for sale nor is it interested in any consolidations, mergers or other disposition of its assets"; so said the company last week to quash rumors of a merger . . . Reserve Mining Co. is beginning to put steel up on a taconite processing plant near Beaver Bay, Minn.; other taconite projects in the Minnesota area are under way by Erie Mining Co. and Oliver Mining Division of U. S. Steel Corp. . . . National Labor Relations Board rules that a union cannot strike over contract demands except when a contract, by its own terms, is subject to either alteration or termination . . . The brass mill and copper wire and cable industries will formulate defense plans similar to those evolved to minimize disruption to steel production in case of enemy attack.

This Week in Metalworking

The shifts in finished steel capacity since 1951 are shown in American Iron & Steel Institute's latest directory (p. 54) . . . Metal marking for military items moves a step nearer as the three armed services agree on an identification system (p. 55) . . . Welding rod sales are down, but not desperately so (p. 56) . . . The last legal roadblock for piggybacking is gone with the Interstate Commerce Commission's ruling that hauling of truck trailers on flat cars is a legitimate railroad function (p. 58) . . . You can reduce selling costs without scuttling your sales program (p. 65).

MUSIC WIRE

BY

WASHBURN

has reached even higher standards of QUALITY than ever before. Our **CADMIUM** plated Music Wire especially merits your careful investigation if you are interested in superior corrosion resistance.

Our QUALITY will satisfy you . . . Our SHIPMENTS prompt, from ample stock . . . Our INTEREST in Customer requirements means "Once a Washburn Customer Always a Washburn Customer"

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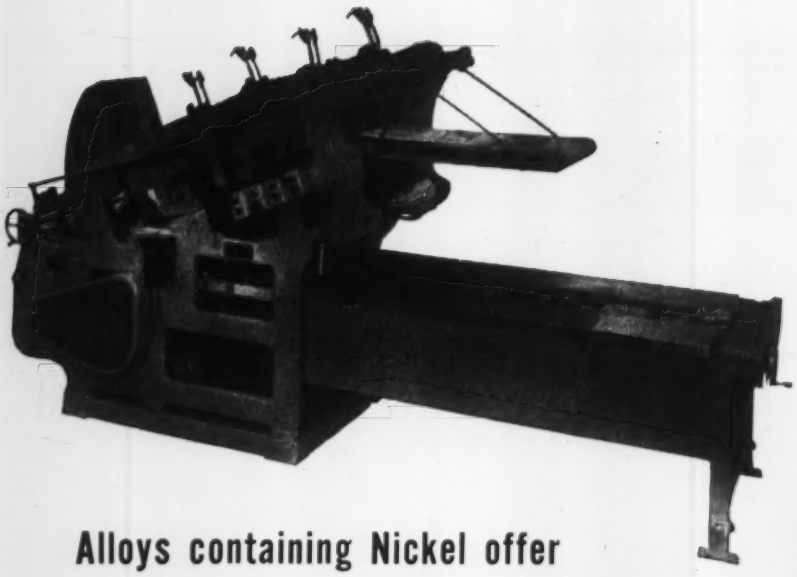
WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES



STAINLESS STEEL CONTAINING NICKEL resists attack by chemicals and atmospheres over a wide range of concentrations, pressures and temperatures. At elevated temperatures it resists oxidation, yet retains toughness and high strength down to —400°F. Easy to clean and keep clean, chromium-nickel stainless steel is used extensively by Package Machinery Co., of East Longmeadow, Mass., in the manufacture of the bacon packaging machine shown here and other food handling equipment.

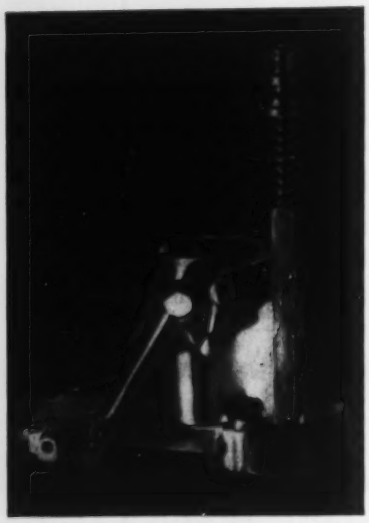
Alloys containing Nickel offer

almost any combination of properties you want

SHOWN HERE are only four of hundreds of different combinations of properties. They give wider play to the skill of the engineer.

You can save weight and provide better durability, and frequently also improve response to fabrication . . . by using appropriate alloys containing nickel. Send details of your metal problems for our suggestions. Write us today.

NICKEL CAST IRONS combine improved strength along with other desired properties such as resistance to heat and wear. The many types available allow you to specify thermal expansion, pressure tightness, machinability and the like. Typical of nickel iron performance, these melting pots cast by C. H. Milles Foundry Company, Chicago, Ill., for use at elevated temperatures, outlasted plain iron pots by 60%.



CAST NICKEL SILVER bottle cappers produced by Universal Casting Corp., of Chicago, Ill., are easy to cast or fabricate, machine and polish. This durable alloy combines corrosion resistance and lustrous beauty. Ease of fabrication and maintenance make it ideal to increase product acceptance and cut costs, too.

HERE'S NICKEL STEEL that withstands thousands of impacts per minute. It's a carburized grade used in hammer, anvil and arbor of an Ingersoll-Rand Impactool, shown here, bolting up an assembly. From the many standard grades of nickel alloy steels available, you can readily choose one with the best combination of properties for both fabrication and end use.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET
NEW YORK 5, N. Y.

Our Blind Spot

It is too bad our nation is so poorly prepared for the role of world leadership that has been thrust upon it. When we emerged strong from World War II, victors and vanquished alike turned to us as the only country capable of providing assistance and leadership.

We have been more than generous in our aid, but our leadership has been faulty. Why do we encounter so much difficulty in providing a high quality of world leadership when we find it so easy to excel in so many other ways?

There may be several reasons, but certainly one of them is that we have a traditionally distorted perspective of the factors necessary for harmony among nations. For all but a few years of our short history as a republic, we have been so screened from European and Asiatic feuds that we were isolationists to a large degree. Also we were so self-sufficient in resources and so desirous of building up our industries that in our attitudes toward foreign trade we were protectionists almost instinctively.

Today the conditions which caused us to be isolationists and protectionists do not exist. The oceans no longer protect us. Our once proud self-sufficiency has dwindled and we are seeking new sources of supply from all over the globe. We are confronted with the necessity of shaking off the outmoded complex of isolation and tariff protection as quickly as possible and of adjusting our thinking to internationalism and a freer exchange of goods between nations.

This adjustment may be painful, but we must do it if we are to lead the world to peace. We must realize that in the long run the trading position of a nation is much more important than its current political alignment. The ideologies of the people of a nation may change from time to time, but the daily necessity of receiving the food that sustains life is a constant, unchanging factor.

As a nation, we will not become competent to exercise world leadership until we learn how much more free trade means to most nations than it has to us in the past.

E. C. Shaner

EDITOR-IN-CHIEF

CUTTING SALES COSTS: This week's "cover story" deals with the timely subject of how to reduce selling costs. According to the Sales Executives' Club of New York (pp. 65, 66, 67), the average cost of making an industrial sales call is $17.24 and the average cost of obtaining an industrial order is $187.39. To reduce these costs or to get greater value for the

money spent presents quite a problem, especially since the cost of maintaining a salesman in the field has increased 25 per cent since 1950.

Probably the greatest opportunities for cutting selling costs lie in two categories: 1. More efficient sales administration; 2. more effective use of salesmen's time. The idea that a star salesman makes a good sales manager deserves a second critical look. Selling in the field and managing a sales force are two different jobs. More reliance upon good marketing research usually will help a salesman to use his time more profitably.

* * *

BETHLEHEM'S BIG GAIN: Ever since it was learned that Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. were considering the possibility of a merger, other steel producers and many steel consumers have been speculating as to what effect such a consolidation, if consummated, would have upon competition. The fact that the merger would give Bethlehem important facilities in the Midwest and would bring to it seamless pipe and cold-finished bar capacities which it now lacks means that the pattern of competition among certain products and in certain consuming areas is likely to be altered appreciably.

Interest in the proposed merger also has brought out the fact that Bethlehem in recent years (p. 53) has been expanding its capacity more or less quietly to an extent far greater than is generally realized. Since Jan. 1, 1948, Bethlehem has increased its steel ingot capacity by 34 per cent, while comparable increases for United States Steel and Republic Steel during the same period have been only 24 and 19 per cent, respectively.

* * *

AVOIDS COMPETITION: Henceforth, the maneuvering among primary steel producers for competitive advantage will be interesting to watch. Each of the first eight in rank has made moves since the end of World War II which indicate that it is trying to work itself into a position where it can escape the full impact of direct competition on tonnage steel.

For instance, several steel companies have acquired facilities for the manufacture of plastic pipe. Other companies which at one time concentrated almost entirely on the orthodox forms of carbon steel recently have been purchasing small, local concerns which manufacture or fabricate specialties of carbon steel.

No one can predict what is ahead for steel producers. It is enough to say that every alert executive is seeking new ways to tap lush markets ahead of competition.

* * *

UNION BACKS FRIENDS: According to Washington observers, major labor unions will conduct unusually thorough campaigns this fall (p. 60) in an effort to elect to Congress as many senators and representatives as possible who are sympathetic to unions. On the basis of previous experience, one can assume that these campaigns will be conducted with plenty of energy, cash and organization. It would be a mistake to underestimate their vigor.

How effective they will be will depend largely upon the quality of judgment employed by union leaders in deciding which senators and representatives they will support. The most powerful drive that can be organized will not induce the voters to elect a woefully incompetent or unacceptable candidate. This was proved decisively in Ohio in 1950 when the late Sen. Robert A. Taft, running for re-election, overwhelmingly defeated an opponent who, while having few qualifications for the office, did have the backing of the combined power, money and smear tactics of all of the major unions of the nation.

* * *

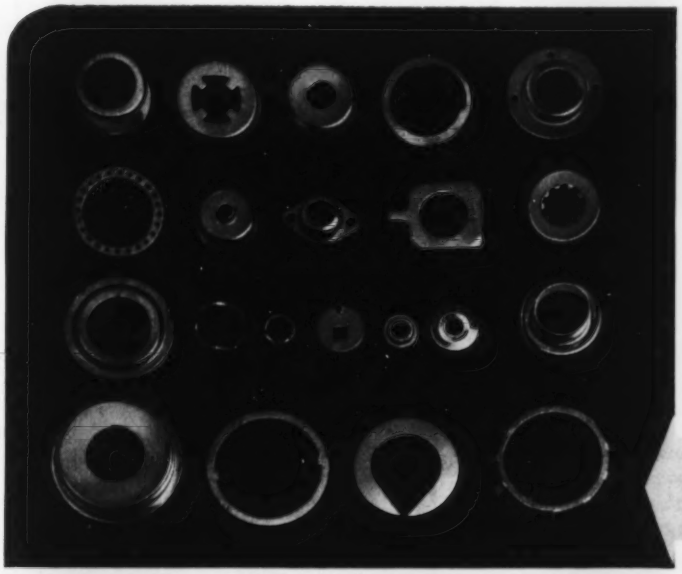
CAN'T DICTATE VOTING: One reason why the unions suffered such a humiliating defeat by Taft in Ohio in 1950 is that perhaps a third or more of union members did not believe in the campaign propaganda put out by the union chieftains. While all captive union papers were condemning Taft viciously, scores of independent labor papers were urging union members to support him. While the late William Green was ousting men from A. F. of L. locals in Columbus because they were supporting Taft, other A. F. of L. leaders throughout the state were conferring with Taft on campaign strategy.

The point is that most union chiefs were attempting to dictate how members should vote and that a substantial number of members resented this dictation. Union influence in politics will not be very strong until there is more democracy in unionism.

A Source You Can Rely on...
A Name to Remember

Experience is a valuable asset in the development, manufacture and distribution of any product. In this respect we offer you the cumulative benefits of *Continuous Service to Industry Since 1887* . . . including origination and pioneering of mass-production equipment for the economical manufacture of washers.

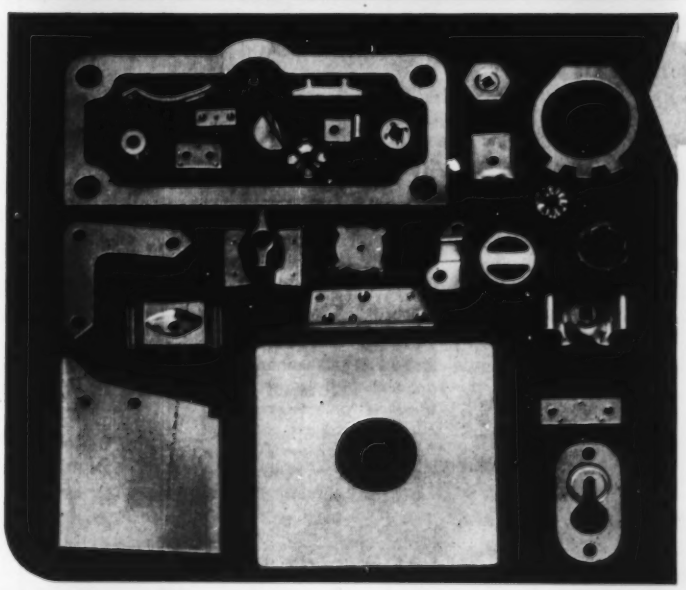
SINCE 1887



No matter what your washer requirements may be . . . whether for U. S. Standard Washers, SAE Washers, Rivet Washers, Lock Washers, Light Steel Washers, Finishing Washers, Machine Bushing Washers or Special Washers of any size, any desired material or finish . . . "MILWAUKEE WROT WASHERS" is the name to remember! Here, in the world's largest plant devoted to this specialized type of production, we have available more than 25,000 sets of dies — a priceless asset in providing the most complete and comprehensive selectivity to meet your needs.

Write for Catalog "30".

WASHERS



STAMPINGS

If it can be punched out of metal—if die-making ingenuity and tool-making facilities can provide the means for producing stampings to meet your production specifications; if the job can be handled most advantageously as a stamping—again, "MILWAUKEE WROT" is the name to remember. Here is a soundly established source of supply you can rely on — plus *Quality Standards* that are a source of pride to us, as manufacturers, and a source of satisfaction to our most discriminating customers. We'd like to serve you.

Let us quote on your requirements . . . covering fabrication in any material and in any finish. Furnished machined, heat-treated or surface-ground, as may be specified.

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THE WORLD'S LARGEST PRODUCER OF WASHERS

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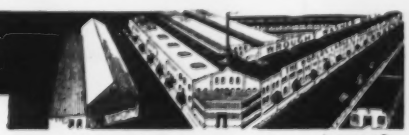

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BILLY PIERCE FAST BALL FAILS TO FLAKE INLAND TI-CO!

From a distance considerably shorter than pitcher's mound to home plate, Chicago White Sox ace southpaw, Billy Pierce, draws a bead on a sheet of Inland TI-CO galvanized steel and burns in a fast one. The sheet gives but the zinc coating stays put!

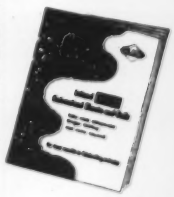
Before a recent game, Billy Pierce, ace Chicago White Sox pitcher and winner of 18 games last year, reared back and fired his blazing "cannonball" pitch at a sheet of Inland TI-CO galvanized steel. Travelling at over 90 miles per hour, the ball drove into the sheet but the special TI-CO zinc coating "rolled with the punch." Not a sign of cracking or flaking!

Not all galvanized applications require the coating to take the impact of a Billy Pierce fast ball, but it's good to know that with TI-CO you're using a sheet that can take the most severe punishment in stride. It means your products made from TI-CO will have unbroken rust protection. They'll look more attractive and last longer too!

The zinc coating stretched with the steel . . . did not crack or peel. The secret lies in the patented TI-CO process which virtually eliminates the brittle iron-zinc alloy layer that causes the ordinary galvanized coating to flake.

Look for the TI-CO brand when you buy galvanized sheets!

GET THE WHOLE STORY on how TI-CO can help you produce better galvanized products for less—and turn out new products not practical with ordinary galvanized sheets. Write today for new TI-CO catalog.



INLAND TI-CO ®

INLAND STEEL COMPANY • 38 South Dearborn Street • Chicago 3, Illinois

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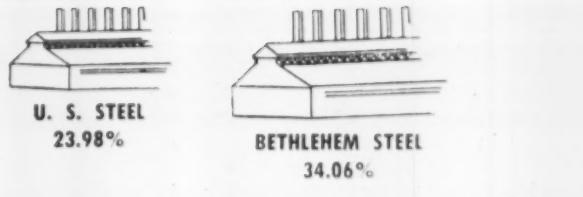
WITH THE ZINC COATING THAT ROLLS WITH THE PUNCH

Merger Talk and Expansions:

Steelmen Jockey for Competitive Positions



COMPANY	% of national capacity company had on . . . Jan. 1, 1948	Jan. 1, 1954	% company increased its own capacity from Jan. 1, 1948, to Jan. 1, 1954
U. S. Steel Corp.	33.14	31.14	23.98
Bethlehem Steel Corp.	14.64	14.88	34.06
Republic Steel Corp.	9.13	8.25	19.33
Jones & Laughlin Steel Corp.	**5.03**	**4.96**	**30.05**
National Steel Corp.	**4.30**	**4.83**	**48.15**
Youngstown Sheet & Tube Co.	**4.25**	**4.42**	**37.43**
Armco Steel Corp.	**3.57**	**3.94**	**45.59**
Inland Steel Co.	**3.61**	**3.78**	**38.24**

THE BETHLEHEM - YOUNGSTOWN merger talk and some little noted facts about the ingot expansion point to the competitive jockeying now going on among steel producers.

Follansbee Steel Corp. is also involved in a possible deal with some unnamed company. Steelmen are likewise branching into other fields. U. S. Steel Corp.'s production of prefabricated homes and swimming pools and Republic Steel Corp.'s marketing of kitchen cabinets, plastic pipe and chain are examples.

Basic—But ingot capacity—its size and location—is still the basic tool which steel producers use in their competitive jockeying. Which of the three biggest steel companies has expanded the most in the last six years? If you respond, "U. S. Steel," the answer is only half right.

Tonnagewise, U. S. Steel made the biggest gain. But of the "Big Three" Bethlehem leads in percentage increase in ingot capacity. Bethlehem boosted its ingot capacity 34.06 per cent. U. S. Steel expanded by 23.98 per cent and Republic Steel by 19.33 per cent.

Score—U. S. Steel's increase was 7,488,800 tons, Bethlehem's 4,700,000 and Republic's 1,662,000.

The three companies still retain their same positions in the industry. U. S. Steel is the largest, with 38,715,000 tons of ingotmaking capacity. Bethlehem is second, with 18,500,000 tons, and Republic is third, with 10,262,000 tons. However, Bethlehem now has a greater share of the nation's capacity than it had six years ago. U. S. Steel and Republic have less (see table).

Quiet Expansion — Bethlehem's increase in tons of ingot capacity is slightly more than twice the capacity of U. S. Steel's Fairless Works, which drew a lot of attention when it was built two years ago. Bethlehem's increase, which came from what was described early this year by Bethlehem's chairman, E. G. Grace, as a "bold but carefully calculated program of expansion and modernization," took place in both Bethlehem Steel Corp. subsidiaries: Bethlehem Steel Co. in the East and Bethlehem Pacific Coast Steel Corp. on the West Coast.

Bethlehem's percentage of increase was not the largest in the country, however. Among the eight largest producers, National Steel Corp., Youngstown Sheet & Tube Co., Armco Steel Corp. and Inland Steel Co. exceeded it.

Youngstown Sheet & Tube raised its ingot capacity 37.43 per cent in the last six years. Its ingot capacity on Jan. 1, 1954, was 5.5 million tons, an increase of 1,498,000 tons in six years.

National now has 6 million tons

of ingot capacity, Armco has 4,902,000, and Inland has 4.7 million. The other company of the top eight, Jones & Laughlin, has 6,166,500 tons.

Of Sheet & Tube's increase, 1,210,000 tons is at East Chicago, Ind. The Chicago area is a good steel market. Not only is it a big one but it consumes more steel than it produces. Now lacking midwestern plants, Bethlehem logically eyes the Chicago area. Much of the East Chicago plant's finishing capacity is for light, flat-rolled products. Sheets and tubular goods are the leading products of the Youngstown area mills of Youngstown Sheet & Tube. An acquisition of Sheet & Tube by Bethlehem would help to give Bethlehem a nationwide network of distribution for its complete product line.

Other changes are coming, too, as the steel industry jockeys for competitive positions. One executive puts it this way: "We are starting to put more emphasis on distribution, less on production, to get more business. We'll have to improve sales efforts, give more service and modernize our pricing system."

Finished Steel Capacities: What Has Happened Since 1951

REALIGNMENT of steel company capacities has not been limited to their ingotmaking facilities. Producers have been shaping their finishing capacities to their increased ingot capacities and to the demands of steel users.

Although ingot capacities have risen generally, finishing capacities have not increased for all forms of steel. For some products which are in decreased demand or which are being outmoded technologically, finishing capacities have declined.

First Since 1951 — These facts are revealed in the 1954 *Directory of Iron and Steel Works of the United States and Canada*, which is now being issued by the American Iron & Steel Institute. This is the first edition since 1951.

In that three-year span, hot-rolled steel product capacity in the U. S. rose from 84,052,390 net tons, or 80.1 per cent of the nation's ingot capacity of 104,502,680 net tons, to 96,641,240 tons, or 77.7 per cent of the total ingot capacity of 124,330,410 tons as of Jan. 1, 1954.

Consumer Influence—Since 1951, some of the nation's finished steel product capacities have increased up to 40 per cent. The increases (see the table) have been particularly large in the products widely used to make consumer goods.

Capacity increases in the three-year period include: Hot-rolled sheet and strip steel and coiled strip for tin plate, up 26 per cent; cold-rolled sheet and strip, up 42 per cent; tin and terne plate capacity, up 12 per cent; hot-rolled bars (other than concrete reinforcing), up 18 per cent; cold-finished bars, up 27 per cent; pipe and tubing, up 14 per cent; and wire rod, up 10 per cent.

Technology Rules — Although total tin and terne plate capacity rose, the hot-dipped product declined while the electrolytic product rose. This reflects technological change.

Steel Finishing Capacities: The New and the Old

(Net tons annually)

Hot-rolled Steel Product Capacities

	Jan. 1, 1954	Jan. 1, 1951
Rails—Standard, over 60 lb per yard	2,007,000	2,383,600
Rails—60 lb or less per yard	112,000	323,400
Long joint or splice bars, tie plate bars	812,510	912,770
Structural shapes—Heavy	5,565,270	5,855,150
Structural shapes—Light	635,625	912,360
Steel piling (rolled)	249,400	282,300
Plates—Sheared	7,455,290	6,858,650
Plates—Universal	1,190,995	1,401,930
Hot-rolled sheets	31,504,045	24,890,230
Coils for cold-reduced black plate, tin plate	6,701,900	4,694,530
Hot-rolled strip	5,177,560	4,907,550
Bars—Other than concrete reinforcement	14,176,150	11,977,810
Bars—Concrete reinforcement	1,958,480	1,658,060
Wire rods	7,001,375	6,360,350
Skelp	5,630,900	5,266,700
Blanks, tube rounds, pierced billets for seamless tubes	4,945,100	3,938,100
Wheels and axles (rolled)	456,700	446,350
Blooms and billets for forging	700,660	677,790
All other—Hot-rolled	360,280	304,760
Total	96,641,240	84,052,390

Other Finishing Capacities

	Jan. 1, 1954	Jan. 1, 1951
Cold-finished bars	3,761,730	2,968,395
Cold-rolled sheets	16,988,680	11,498,330
Galvanized sheets	3,311,620	3,183,460
Long terne sheets	288,600	274,100
Hot-dipped tin and terne plate	2,748,680	3,200,770
Electrolytic tin plate	4,475,050	3,252,570
Cold-rolled strip	3,303,280	2,825,840
Galvanized strip	436,730	366,810
Buttweld pipe	3,387,100	2,869,570
Lapweld pipe	618,000	447,000
Seamless tubing	4,648,130	3,960,900
Electricweld tubing	5,487,040	5,127,700
Spiralweld pipe	171,000	153,000
Gasweld pipe	33,500	18,000
Plain wire	6,781,680	6,129,370
Galvanized wire	1,778,810	1,787,110
Nails and staples	1,235,950	1,200,330
Barbed wire	537,855	532,955
Woven fence	974,260	965,980
Reinforcing fabric and netting	557,140	.....
Bale ties	238,500	173,340
Splice bars, other rail joints, tie plates	1,044,620	912,770
Track spikes	249,800	295,800

Metal Marking Nearer for Military Items

The three armed services accept a marking system, with revisions. It will go into effect one year from the time of final approval by the Defense department

ADOPTION by the Department of Defense of a marking standard for metal products is nearer.

The three armed services agree that a military standard identification marking system is needed and that the standard as it has been proposed is acceptable with certain revisions. After these revisions have been completed, the proposed standard will be referred to the Standardization Division of the Department of Defense for final approval and issuance. It is to become effective one year from the date of issuance.

Matter of Cost—The proposed standard, as it is being revised, will contain the three tables originally proposed. They will provide alternate marking specifications, offering a choice from maximum to minimum marking. Contracting officers are expected to specify minimum marking when that will suffice.

Table I—Table I provides maximum marking requirements. It is meant to be used on metal products that have to be kept in store at consuming plants and warehouses prior to use, and where identification marks are necessary to distinguish one composition from another. This table set forth these marking requirements:

Flat Products. Marking to be continuous throughout the length with marks at intervals not greater than 3 feet and in staggered rows. Spacing across the width between the staggered rows to be not greater than 12 inches for light metal alloys, corrosion and heat resistant steel alloys, and titanium, and not greater than 24 inches for all other metals (meaning mainly carbon steels). Marked tags to be on bundles and coils.

Bars, Tubular Products, Shapes. Marking to be continuous along length at intervals of not greater than 3 feet. Marked tags to be attached to bundles and coils.

Ingots, Pigs, Slabs, Billets. Marking to be permanent, by means of die-stamps.

Wire. Spools to be marked at both ends, coils to be tagged.

Castings. Each piece to be marked permanently, by die-stamp, with the pattern or drawing number. Small castings to be bundled, bagged, or boxed, and tagged.

Forgings. Each piece to be marked permanently, by die-stamp, with the die or drawing number. Small forgings to be bundled, bagged, or boxed, and tagged.

Table II—Table II will be specified where less marking is desired. It will be used mainly by Navy Bureau of Ordnance, Navy Bureau of Ships and Army Ordnance Corps on heavy-tonnage requirements, as ammunition steel, that go right into production lines without prior storage. The table calls for these requirements:

Bars. To be marked at least once near each end.

Flat Products. To be marked at least once on each piece, or bundle or coil.

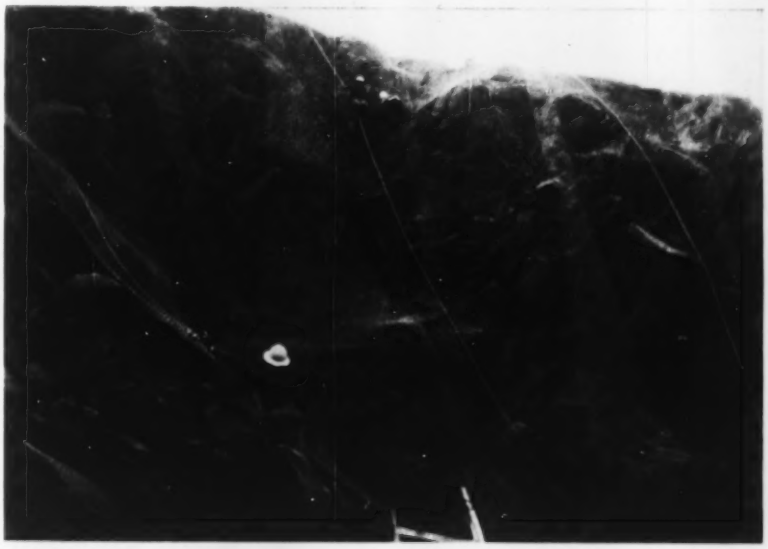
Tubular Products. To be marked at least once near each end.

Table III—Table III is for use in specifying the marking of steel ship plate for the Navy. It applies to both plain and galvanized plate. Each piece is to be die-stamped in one corner, not more than 12 inches from either side, and encircled with white paint. In such marking, the grade, or grade and class, designation is to be in letters ¼-inch or more high.

The proposed marking standard is intended to fit in with present practice of aluminum, magnesium, stainless steel and titanium product manufacturers. They already are marking their products as contemplated under the standard. Manufacturers of forgings and castings also are marking products.

Marking so far has not been adopted generally by the producers of carbon and alloy steels and of copper and copper-base products. Some of the warehouse interests, however, mark them.

The Air Force in its procurement continues to favor suppliers that mark the products.



Safety Net for a Dam

Dambuilders at Palisades dam project on the Snake river in Idaho were troubled by rock slides so they strung this "safety net" of U.S. Steel Cyclone Fence along the steep hillside. The fence—20,000 square feet of it—protects workers doing excavating for tunnel intake structures; after the dam is finished the shield will be left in place to protect completed structures. Thick steel cables strung through anchor rods set in concrete support the barrier

down...
BUT NOT DESPERATE

Welding rod shipments will drop for the second consecutive year in 1954. They'll still be about equal to those of 1950, though

SHIPMENTS of welding electrodes are going to be down about 24 per cent in 1954 from 1953, according to reports to STEEL directly from welding rod producers.

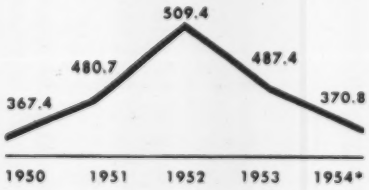
But the accompanying chart shows that even when shipments do drop that much they will be above 1950's 367.4 million pounds in shipments based on National Electrical Manufacturers Association figures.

NEMA figures show first-five-month-1954 shipments of welding electrodes are off more than 24 per cent from a year earlier. Industrymen agree the first half, and particularly the first quarter, will probably be the low period for the year. NEMA figures also show shipments of mild steel rods—biggest volume producer—are off the least of the various types: Mild steel electrode shipments for the first five months of 1954 are off 37 per cent compared with the first five months of 1953; nonferrous electrode shipments for the same period are off 49 per cent; and alloy steel electrode shipments are off 50 per cent for the same period. NEMA figures, while not covering the entire producing industry, are regarded as authoritative.

Striking Feature — The most striking facet of this year's welding rod shipment forecast is not that they are dropping as much as 24 per cent but that they are not dropping more than that. Defense demand for welding electrodes is practically nil this year. The biggest single defense user of rod—combat tank fabricators—is idle; other big defense users—aircraft frame, engine-mount and landing-gear manufacturers, warship builders and automotive-type equipment manufacturers—all are quiet this year compared with the past four years.

Of large civilian users, the construction and automotive industries are burning up welding rod at an active pace. Appliance manufacturers' consumption is off from the preceding year but still fairly good. Shipbuilders' demand is smoldering; railroad consumption has been very weak for over a year, oil and gas line fabricators' demand is fairly strong as is call for welding rod from bridge builders.

Welding Rod Shipments
(In thousands of pounds)



Source: National Electrical Manufacturers Association
* Estimated by STEEL

Technological Cushion—With demand from prime consumers like defense contractors, shipbuilders, railroad equipment fabricators and the aircraft industries all way off, it's a wonder that welding rod shipments will still top 1950's volume. Much of the credit for that staying power can be given to two technological advances in welding electrodes which have been exploited since World War II. One is automatic submerged arc welding; the other is high speed, mild steel electrodes with iron powder coatings.

The latter type of welding rod has been called "the poor man's automatic welder." This type electrode, say its producers, enables even the inexperienced welder to lay down a smooth weld with a 30 per cent increase in efficiency compared with other mild steel electrodes. Six years ago high speed rod was priced at about 29 cents a pound and its economic advantages were difficult to see when welding rod which would do the same sort of job could be had for 11 cents a pound. Now some types of high speed rod are priced at about 17 cents a pound and, together with offering greater efficiency in operation, can claim to be cost reducers.

Fast Sales — Automatic submerged arc welding machines were laying down upwards of 200 inches of weld per minute last year. Rates up to 300 ipm and usage on thinner gages and economic usage on ordinary carbon steels definitely are in prospect for this method. Cost savings made possible through faster welding speeds assure a substantial flow of this type of welding rod right through any kind of business condition which may be ahead. For example, one large producer of this type of rod reports its sales are off less than 10 per cent thus far in 1954. That's a substantially better sales record than the industry as a whole is showing.

Air Force Contracts Let

More than $200 million in new contracts, part of the $1 billion in new procurement promised dur-

ing the next three months, have been received by Air Force suppliers.

Biggest contract went to the Aircraft Engine Division of Ford Motor Co., Chicago, for 403 Pratt & Whitney J-57 Turbojet engines at a price of $92,598,272.

The Allison Division of General Motors Corp., Indianapolis, received an order for $40,001,800 of J-33 jet engines and spares. It will deliver 721 of the power plants used in the Air Force's Matador guided missile and other weapons.

Radioisotope Control Extended

Revised radioisotope distribution regulations of the U. S. Atomic Energy Commission subject radioisotopes produced in any publicly owned or privately owned reactor in the United States, its territories or possessions to the same radiological safety controls as those produced in or distributed by AEC facilities.

One privately owned research reactor is in operation, and construction of several others has been planned by universities.

Study of Paperwork Ordered

A special study of the paperwork and record keeping of corporations, small business and individuals required by federal agencies has been ordered by the Hoover Commission.

Aimed at reducing the burden on private industry, the study will be made by the commission's Task Force on Paperwork Management composed of prominent business executives. Industry sources, according to the chairman, former President Herbert Hoover, question the value of such reports against the cost of preparing and filing them and their limited use.

Among other things, the task group will consider plans now pending in the Internal Revenue Service, one of which would eliminate the income tax returns for approximately 35 million taxpayers, enough returns to fill 10,000 file drawers. Sponsors of this plan claim a potential savings to industry of more than the estimated $22-million-a-year savings to the federal government.

When the small business operator can't swing a loan from private sources he can always turn to . . .

Uncle Sam: Money Lender

NEED A LOAN? The federal government maintains several agencies to give financial assistance to smaller businesses. Try one of these:

Small Business Administration—This agency is designed to assist small enterprises—manufacturers, distributors and service establishments — which are independently owned and operated and not dominant in their field.

SBA offers three types of loans: Bank participation where both the agency and a bank share in making the loan, direct loans and disaster loans for restoring business facilities and inventories. Applicants for loans should file at a bank or other financial institution or at the nearest SBA regional or branch office.

Treasury Department — The Treasury department, under the RFC Liquidation Act, has absorbed a number of the loan functions of the RFC which will now be available through the Treasury department.

Federal Reserve System — This loan source will provide working capital to establish commercial and industrial businesses when the borrower is unable to obtain financial assistance from the usual sources.

Loan applications should be filed at any bank or lending institution or direct to one of the 12 Federal Reserve banks or 24 branches throughout the country.

Defense Minerals Exploration Administration—To expand production and supply of strategic and critical materials and to encourage their exploration and development, the government has set up this administration to help finance these projects, contributing from 50 to 90 per cent of the costs. Apply to the Defense Minerals Exploration Administration, Washington 25, or to the regional offices of the Bureau of Mines.

Maritime Administration — The Maritime Administration will make loans to private shipowners for new shipbuilding, reconstruction or reconditioning of vessels. Operator should apply to the Maritime Commission, Washington.

Veterans Administration—Eligible World War II and Korean war veterans may have various types of loans made by private lenders guaranteed or insured by this agency or in some cases may receive a direct loan. This financial assistance includes loans for machinery, tools and equipment, and for working capital in the operation of a business. Application for VA loans should be made to banks and other private lenders.

Export-Import Bank—This bank makes loans to aid in financing U. S. exports and imports and to develop foreign sources of strategic materials. Generally, this bank finances only U. S. equipment, materials and services to be exported for use in a specified project abroad. Apply to the Export-Import Bank, Washington.

Piggyback by Rail Becomes Legitimate

After a couple doubtful months, the ICC has ruled piggybacking is a legal railroad function. It's a whopping victory for the railroads in their fight for more traffic

PIGGYBACK service is definitely a railroad function which can be offered by the railroads without motor carrier certification using either their own truck trailers or the trailers of common motor carriers, says the Interstate Commerce Commission.

Overwhelming—The ICC decision is a great victory for the railroads and a beautiful opportunity. They have a chance to develop, practically from scratch, a new mode of freight transportation.

Naturally, that new mode of freight movement is not going to develop overnight. Don't expect final answers on any phase of piggyback service for months yet. For one thing, the ICC decision which settles the fundamental legitimacy of piggybacking for railroads does not approve of the reasonableness of present piggyback tariffs. Those tariffs are being considered on a separate ICC docket.

Where We Are — For another thing, the railroads are proceeding into piggybacking cautiously. Says one railroad executive: "We're learning to walk before we run. Watch for this service to change and expand before the year is out."

However, here's how piggybacking stacks up at the present:

Cost—Cost of piggybacking between points of service is exactly, or as near as possible, what the truck rates are.

Points of Service—Only major points are now connected by piggyback service such as Chicago, Cleveland, Pittsburgh and New York. Additional service between intermediate points will be filled in as demand warrants.

Products — Not everything can be piggybacked. Railroads are starting out with limited products —usually those accounting for large volume of traffic between the points being serviced by piggyback. Thus, the products would vary for practically each road. A phone call to the freight agent of the railroad serving you will tell you whether your products can be piggybacked. More products will undoubtedly be added.

Delivery — Like costs, delivery is scheduled to meet truck deliveries as nearly as possible. In some cases, such as the Erie Railroad's service from Chicago to New York, the piggyback service beats truck time. For Erie delivery is the "second morning" out of Chicago while truck delivery is the "second day" out of Chicago.

Packing—Here again, railroads are starting out cautiously. Chances are freight will be accepted for piggyback shipment only with the same packing as required by the terms of the uniform rail classification packing requirements. Check with the local freight agent or a copy of the railroad's tariff for specific packing needed. It's hoped that packing and blocking requirements can be changed from strictly rail standards to something more like truck standards on certain metal products after the railroads gain experience with piggyback shipping.

With charges and deliveries so nearly equal between piggyback and all-truck shipments, how do the railroads expect piggyback service to attract new business? For three reasons, say railroad spokesmen: 1. Continuity of service—by shipping all-rail or piggyback you have only one transportation company to deal with; 2. piggyback is an all-weather service, undaunted by adverse weather conditions; and 3. piggybacking will give back to the railroads some of the "cream traffic" which will improve their financial position and in the long run lead to better service and lower rates.

June Steel Employment Up

Employment in the iron and steel industry of the country recovered to an estimated 608,900 in June from 606,400 in May, American Iron & Steel Institute reports. Average for the first six months this year was estimated at 621,000.

Average hourly payroll cost of wage earners in June reached a new high for the year at $2.315, compared with $2.314 in May and a six-month average of $2.298.

Estimated total payroll of the industry in June was $236,406,000, compared with $234,413,000 in May. In the first half of the year it was $1,440,997,000.

Wage earners worked an average of 36 hours a week in June, compared with 34.9 hours in May and an average of 36.1 hours for first half.

Extended Radio Use Asked

Committee on Manufacturer's Radio Use of the National Association of Manufacturers has petitioned the Federal Communications Commission to permit manufacturers to communicate by radio with mobile units outside of yard limits for productive purposes only.

Present rules of radio use prohibit a mobile unit crossing the street from one part of the plant to another, or in the case of an ore boat unloading at a steel company dock.

More Missile Production Seen

Increased production of the Corporal, the Army's most advanced guided missile, was assured by Harvey S. Firestone Jr., chairman of Firestone Tire & Rubber Co., Akron, following inspection of the firm's new factory under construction in Los Angeles.

The $2-million plant, located adjacent to the rubber company's main tire plant, contains 350,000 square feet of floor space and will augment present missile manufacturing facilities.

The Corporal, an electronically directed missile capable of striking selected targets deep in enemy areas, is designed to carry either atomic or high-explosive warheads. Fired vertically from a mobile launcher, it can propel itself to targets far beyond the range of the present 280-mm atomic cannon.

Steel Helps Bridge the Gaps in Highways

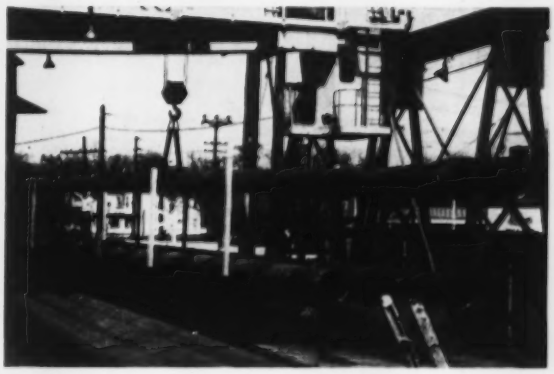
1

ANYONE CAN SEE the steel in the sturdy arches of bridges. But much steel in bridge construction is never seen. The accompanying pictures show four ways in which steel is a hidden asset.

And there are others. For example, reinforcing trusses permit the use of lighter concrete slabs—a matter of importance in bridges over 300 feet in length.

Formed steel bridge flooring can't be seen either because bituminous concrete is poured over the plate—still another way that steel helps bridge the gap in highways.

2



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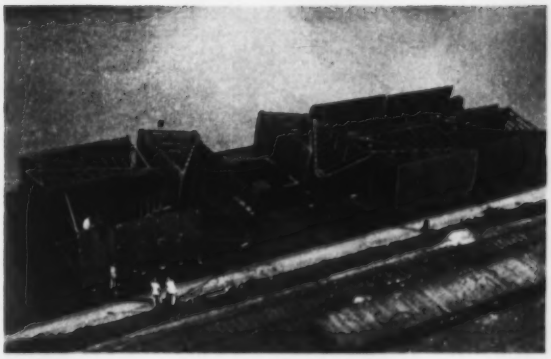


4

1. TIGHT SQUEEZE—Rivets in the dark corners must hold just as tightly as the rivets everyone can see

2. SUNKEN STILTS—Steel piles driven deep under water will help support the 66,000 tons of the giant new bridge soon to span the Straits of Mackinac

3. MUD KNIVES—Wedges with sharp cutting edges will be bolted together to form a circle. Driven through Mackinac Straits mud to bedrock and filled with concrete, they will support tall bridge towers

4. FALSEWORK—Bridges to build a bridge will give temporary support to permanent steel while the New York State Thruway is carried across the Hudson

By E. C. KREUTZBERG Washington Editor

Labor's Politicos Lay Plans For a "Friendly" Congress

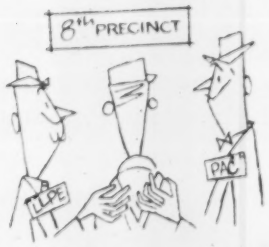
BIG LABOR LEADERS are determined to make the full weight of their influence felt in the November elections.

They are displeased with much of the Eisenhower program and with the voting record of most Republicans in the 83rd Congress. They have learned a lot about political strategy since 1952 when the late Senator Taft was re-elected by a record majority in the face of their opposition. They have set up machinery which they believe will enable them to accomplish their objective: The election of a "friendly" majority in both houses in the 84th Congress.

Experienced politicians view this situation with apprehension on the one hand and cheer on the other. Labor union membership totals around 16 million. If the labor leaders can get these people and their families and friends to vote "right" in November, President Eisenhower's program is in for a rough time.

Concentrated Attacks . . .

This year the aims and strategy of the two big labor groups and the other smaller ones have been unified to a maximum degree. First, AFL's Labor's League for Political Education and CIO's Political Action Committee will agree as to candidates they will support. Then they will concentrate their efforts in districts won by less than 5 per cent of the vote in 1952. "By centering our attack on marginal districts rather than hopeless ones," says an LLPE executive, "we have a good chance of upsetting the antilabor group in Congress." Playing into its hands in 1954, Big Labor believes, is the fact that this will be a mid-term election with the customary light vote. Labor expects to win out in many districts by getting its own



people out in force while many other voters stay home.

First blood in the new strategy has been drawn by the International Association of Machinists and other unions who were successful in the recent Texas primaries in killing aspirations of Wingate Lucas for re-election to the House. Rep. Lucas sealed his doom by introducing two "antilabor" measures in the present Congress, one to outlaw industrywide bargaining and the other to give the states paramountcy in the control of strikes and picketing. Labor leaders think that what happened to Rep. Lucas is only a foretaste of what is still to come.

Labor's Team . . .

The labor campaign this year is based on the concept that "elections are won in the precinct." Area directors from headquarters attend local union meetings in marginal districts to explain issues and union objectives. As November approaches, there will be slogans, leaflets, radio broadcasts and newspaper advertising. Local unions will designate members to check official registration lists against union rosters to make sure that all members will be eligible to vote. Dissatisfied farmers and other friendly segments will be invited to "team up" with labor. To raise campaign funds, union members will be buttonholed for contributions.

Another WPA? . . .

All this year Big Labor has been particularly virulent in condemning the administration for a "do-nothing" attitude in facing up to threats of growing unemployment, and in this campaign the recent moderate business upturn has been virtually ignored. Labor has advocated diversified government works programs as the means of bringing about "full employment." Labor economists have not been at all deterred by the huge public spending that would be necessary to implement these programs. A management-connected economist estimated in May that adoption of the spending programs advocated by labor would have increased the estimated deficit for fiscal 1955 from $2.9 billion to around $12 billion.

Washington recalls the classical instance after World War II when the CIO called for a general wage raise to come out of profits and without any compensating raises in prices of manufactured goods.

In general, Big Labor regards the federal government as its chief instrument in getting what it wants, so that the emphasis is on electing a White House occupant and a Congress that see eye-to-eye with labor. Whether labor's atti-

tude toward government controls, toward tax policies, toward public spending—in short, toward the various issues that spell the final fate of the private enterprise system—could kill the goose that lays the golden eggs does not appear to be a question of importance.

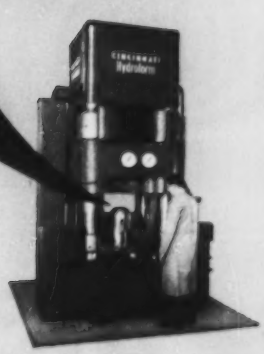
Trust only Hydroforming *for this draw work!*

Vinyl-metal laminate is Hydroformed with *no change* to surface texture

Brightly-colored vinyl sheets, having a deep-grained, leather-like surface, are now being laminated to various gages of steel and aluminum sheets. The result is an attractive structural material having many interesting properties and possibilities.

But how to shape this material without marring or destroying the vinyl plastic presents a difficult forming problem . . . *except* for the Cincinnati Hydroform. Severe draws were accomplished *without altering* the vinyl surface.

The Hydroform's giant, *gentle* squeeze is achieving many production economies for numerous manufacturers. Let a Cincinnati Milling field engineer brief you on the advantages. For a description of Hydroform operation and specifications of the 8′, 12′, 19′, 23′, 26′ and 32′ machine sizes, write for Bulletin M-1759-3.



Vinyl-metal laminate drawn in one operation into a full hemisphere, 4½″ radius, and into a straight-walled cup, 4½″ dia. x 3½″ deep. Gage of the hemisphere is 0.049″ steel, 0.021″ plastic. Cup is 0.022″ steel, 0.015″ plastic.

CINCINNATI **Hydroform**

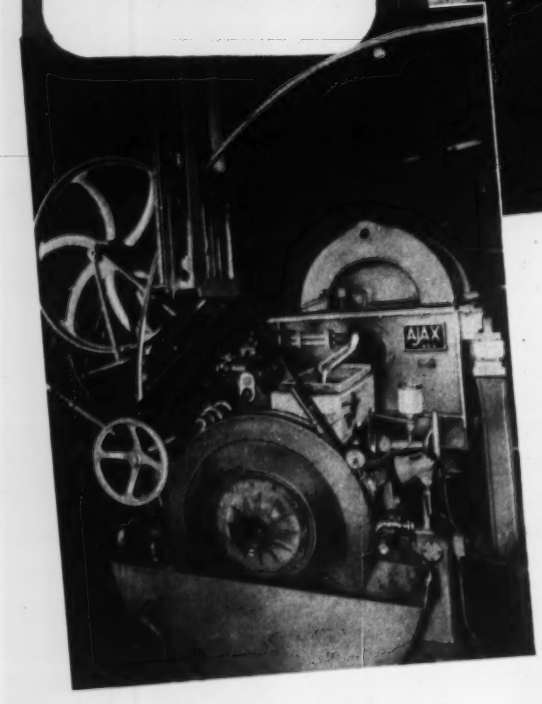
PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

Southwire Company

with the help of

AJAX FURNACES

Above photo shows aluminum rod passing from the Properzi casting machine in the background to the rod mill in the foreground. AJAX furnace is at right of the Properzi machine.



Close-up of Properzi machine showing how molten metal is fed to it from AJAX furnace.

In connection with the well-known Properzi method, the Southwire Company of Carrollton, Georgia, is using an AJAX low-frequency induction furnace for the quick and efficient melting of high purity aluminum.

This combined melting and holding furnace is ideally suited to mass or continuous production processes, because the molten metal can be fed in a steady stream from the holding reservoir of the furnace, which in turn is kept supplied with metal from the melting reservoir.

The induction melting process produces an inherent stirring of the metal due to electrical impulses, resulting in a homogeneous mix. Scrap loss averages less than 1 pct. Working conditions are comparatively clean and cool because the only heat generated is within the metal itself.

Write for re-print of article entitled "ALUMINUM: Continuous Casting Gaining"

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

Foreign Buyers in U.S.

U. S. publication lists buying missions in this country for over 50 foreign countries

AMONG new sources of information recently put out by the government for U.S. businessmen is a revised list of foreign government purchasing agencies in the U. S.

More than 50 countries are included with agencies listed by country and their U. S. addresses. Only missions which have procurement and purchasing functions are listed; embassies and legations which act in a purely liaison capacity have been omitted.

Roll Call—The countries which are represented in this publication are Afghanistan, Argentina, Australia, Belgium, Bolivia, Brazil, Burma, Canada, Ceylon, Chile, China, Colombia, Cuba, Czechoslovakia, Ecuador, Ethiopia, France, Germany, Greece, Guatemala, Haiti, India, Indonesia, Iran, Iraq, Israel, Italy, Jordan, Korea, Mexico, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Paraguay, Peru, Philippine Republic, Saudi Arabia, Spain, Sweden, Syria, Thailand, Turkey, Union of South Africa, Russia, United Kingdom, Uruguay, Yemen, Yugoslavia, and, far from least, Venezuela.

For world traders interested in expanding exports, this appears to be "must" reading. Copies are available for 10 cents from the Sales and Distribution Division, U. S. Department of Commerce, Washington 25, or from any of the Commerce department's field offices.

Two-way Trade Measured

Speaking of the interdependence of North and South America through trade, E. G. Cale, director, Office of Regional American Affairs, said: "Our trade (U. S. with Latin America) of nearly $7 billion annually is divided almost equally between imports and exports. Our exports to Latin America are equivalent to about 1 per cent of our national income and represent about 20 per cent of our total exports. Their exports to us are equivalent to about 8 per cent of their national income and represent about 50 per cent of their total exports."

German Steel Since the War

Custodians of the West German steel industry, who were appointed by the Allies to decentralize the German steel companies, have just published their final report: *Reorganization of the Iron & Steel Industry in Western Germany*, Verlag C. H. Beck, publisher. The book gives a thorough analysis of the German steel industry and of the various stages of reorganization since World War II with which the Allies had so much influence. Price is $11.50 (48 marks).

Pointed Nail Story

Steel Co. of Canada, with a new mass production method for the manufacture of threaded nails, says it will market threaded nails in the price range of common nails. Stelco claims the new nail will cut construction costs because fewer and shorter nails of this threaded type are required. Its trade name, Ardox, has been registered.

U.S. Buyers in Britain

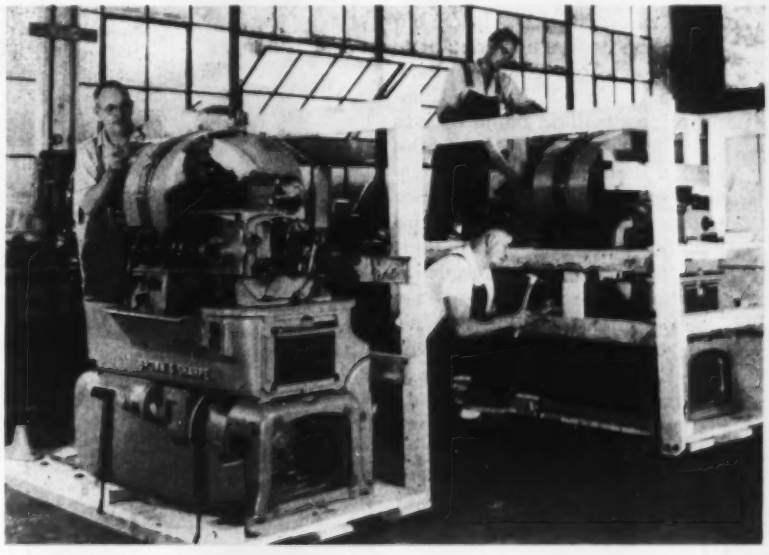
Birmingham, England, exhibit aims to find British suppliers for U. S. buyers

NEW SERVICE for buyers of British industrial products is the Birmingham Exchange & Engineering Center.

The center will display the products of over 200 leading British firms and will have the catalogs of another 7000 firms together with making available expert advice about the firms' capacities and capabilities.

Who Displays? — Among the present exhibits (there's already a waiting list of companies wishing to display their wares at the exhibit) are ones on jet engines, electronic instruments, gages, press tools, valves, machine tools, nuts and bolts, foundry products and handling equipment.

A foreign buyer of British metalworking products will get red carpet treatment at the exhibit, say its sponsors. A U. S. buyer, for example, can get information on any product or company in which he's interested or be put in direct contact with the firms themselves.

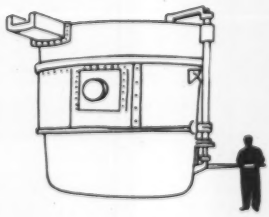


Rushing to European Show

Two Brown & Sharpe machines, an OG and a 2G Automatic, are being rushed through the boxing department on their way to the 4th European Machine Tool Exhibit, Milan, Italy, Sept. 14-23. Two other Brown & Sharpe machines, a Number 13 Universal and Tool Grinding Machine and a Number 0 Omniversal Milling Machine, together with machines above will be put into operation at the show

*. . . this 285-ton Pollock Open Hearth Ladle is welded on a special positioner designed specifically for jobs like this. The ladle is placed on the rollers and revolved until the ladle is in the best possible position for "down-welding." Using the positioner results in better welds. A positioner for a 285-ton ladle is big . . . it has to be. But at Pollock, where thinking is as big as the job itself, huge machines are commonplace.

The William B. Pollock Company prides itself on being able to do the big jobs. It has the skilled men, the resourceful engineers and the special machines (as this positioner) that are needed to turn your biggest drawing board dreams for iron and steel making facilities into solid, practical realities. When you're thinking "big," think of The William B. Pollock Company . . . specialists in all matters and equipment pertaining to the manufacture of iron and steel.



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BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

How To Reduce Selling Costs Without Scuttling Your Sales Program

The average cost of industrial sales calls is $17.24; of industrial orders, $187.39. You can get more for that money or cut those charges

"THEY THOUGHT we had come up with a white rabbit," said the management consultant of a manufacturer suffering from slipping sales and creeping sales costs. "We simply showed them how to get full value from their sales expense dollar."

The situation is true in industry today. More money is being pumped into the sales effort to add new business or maintain present volume. In the competitive swirl selling costs are going up—basically because volume is going down and there is greater competition to get orders. And when heavier selling and promotion are required, a problem is to keep selling costs in line.

Attack Waste—No manufacturer would think of making a product without knowledge of what it costs and how profitable it will be. Yet many run their sales operation without adequate knowledge of costs or profits and how to control them.

Many managements don't attack waste in their marketing activities simply because it's so hard to get at. Plant and office efficiency are easier to develop because facts can be more readily determined and conditions more easily controlled. Yet sales costs still remain an area only superficially explored for cost-cutting opportunities.

Expensive Order—Average cost of the industrial salesman's call, according to Sales Executive's Club of New York, is $17.24, cost of getting an order $187.39. The cost of keeping a salesman in the field has increased more than 25 per cent since 1950. It's obvious that you're wasting time, money and effort if your salesman is chasing smokestacks, talking to poor prospects or neglecting to follow through on good ones.

Analysis and close control can bring preplanning of sales operations, eliminating extravagances and poor performance along the way.

Needed: A Policy—Sales slippage can be caused by lack of objectives and policies. You should know how many sales people are needed, what activities they must perform, what standards of performance should be. Make sure your policies are geared to field selling conditions, that your salesmen know what they are and how to apply them. Lack of effective communication can cause failure of many well-laid sales plans.

At the beginning of 1954, U. S. manufacturers employed about 550,000 of the nation's 3.5 million salespeople. That's an increase of less than 30 per cent since prewar days, yet each man is being asked to sell more than twice as many goods and keep 31 factory workers in their jobs.

Authorities on selling have stated that we must increase selling proficiency by 20 to 25 per cent and/or recruit and train upwards of 500,000 additional salesmen to dispose of our factory output. "Our major problem," says Al N. Seares, vice president, Remington Rand Inc., "is to immedi-

This salesmen's time study shows how budgeting pays off . . .

	LOW-RATED SALESMAN	HIGH-RATED SALESMAN
Company procedures	13%	21%
New business	11%	22%
Selling talk	21%	40%
Nonselling talk	43%	11%
Waiting	12%	6%

Will increasing sales expenditures pay off?

Suppose you do an annual sales volume of $700,000, but your facilities would support an $800,000 level yearly. How much can you reasonably spend on your selling effort to lift sales to that mark?

A case study by Research Institute of America turned up a company with just that situation. It had a sales volume of $700,000, yielding a net profit of $50,000 or 7.14 per cent of sales. To determine if spending an extra $30,000 to boost sales was justified, it charted the possibilities. It assumed that such an expenditure would bring in the added $100,000 in sales. It calculated its manufacturing expenses and found that the added $100,000 volume could be produced for $50,000 profit before selling costs. Selling expenses would be $30,000, so the net profit would be $20,000 on the added volume. That $20,000 plus the $50,000 earned on the present $700,000 volume gives a net of $70,000, or 8.73 per cent of the $800,000 sales.

So, if all went well, it would be worth while to spend the added $30,000. But what if the $30,000 didn't produce an extra $100,000 in sales, just $50,000? Then total profit would only be $45,000, or 6 per cent of sales. Then the $30,000 wouldn't be worth spending.

The company also made a third calculation: How much can it afford to spend to boost sales another $100,000 and still keep the sales ratio at the current 7.14 per cent? That figure turned out to be $42,800.

Thus, to know if increasing sales expenditures will pay off, estimate how much volume you can reasonably expect with your present sales and promotion effort. Then try to judge how much an added sales budget would bring in if fully successful or if it doesn't quite succeed.

ately increase the selling productivity of every salesman." That can be done, he feels, by applying some of the technological techniques successful in solving production problems.

Sales Duties—Workload of the salesman has a bearing on expense. The underloaded salesman wastes money because his pay is out of line with his duties. The overloaded salesman can't do full justice to his territory. To determine workload, define the salesman's duties fully, assigning a time factor to each task. Count and classify the total contacts the entire sales force must make each year and check their geographical distribution by size and type of business. To make a sound appraisal, know what your salesmen should be doing and what they are doing.

Often faulty training creates topheavy sales costs. Determine the *best* selling methods for your product and company, then teach them to every salesman. It's also more logical to train supervisors who coach the salesmen in productive methods than to train the men themselves. Don't overlook management training either: One recent study shows a good portion of today's sales supervisors are top salesmen thrown into the job without adequate training in the intricacies of sales management.

$5 an Hour—The salesman has but 1200 hours a year to work. If you pay him $6000, it costs $5 an hour for his salary alone. Time is a salesman's greatest asset; it can be exploited by preplanning.

If you have ten salesmen averaging five calls per day each and can help them make one more call per day you have added the equivalent of two additional salesmen with little if any increase in selling expense. A good way to stimulate a salesman is to show how much income he derives from each call. If each call earns a man $5, one more call a day will jack his income $100 a month.

Sales Balance—Much sales planning is based on the theory that 10 to 30 per cent of any market accounts for a majority of that market's potential. Ideal sales balance is in concentrating on the big buyers in the top 30 per cent and still not neglect the potentialities among the less exploited 70 per cent.

A bad habit salesmen fall into is to criss-cross their territories pursuing hunches and hopes. Another is to get their time schedule so confused that they either fail to follow up at all or fail to pick up at the right time and point. As most sales are made after the fifth call, nothing is a greater waste of time once you have created interest than to neglect to follow through.

The Real Buyer—Many industrial salesmen consider they are doing an effective selling job when they contact the purchasing agents in potential customers' plants. While the P. A. performs a valuable service as point of initial contact, he sometimes does not make the decision as to what is bought. The sales story must also be presented to operating personnel who are actually concerned with the use of the item and influence the purchasing decision.

The salesman's compensation is normally your biggest item of field selling expense. Compensation plans (e.g., straight salary, salary plus bonus, salary with drawing account and straight commission) all rate differently in motivational value and must be suited to your company and product. Frequently straight commissions motivate the salesman to concentrate his efforts on activities which may not be in the best long-range interests of the company, and to neglect others which are a basic duty. A sound incentive plan must be tailor-made for the company. It needs careful thought, realistic standards, imagination and flexibility.

Adequate compensation elimin-

ates frequent turnover of good men and resultant training costs for replacements. A traveling expense plan that provides for payment of legitimate expenses is important as inadequacies are liable to be magnified out of proportion to the money involved.

Market Blueprint—One of the best ways to increase total company sales is to increase volume in important undeveloped markets. To do so you must blueprint your markets to find where you can get the highest sales at the lowest cost ratio. Market research can help you find out who buys what, where and how much, giving you a specific picture on potential for precision allocation of your sales effort.

One company found over 40 per cent of its accounts were unprofitable, adding only 10 per cent to total sales volume. Gradual dropping of these cut marketing expenses in half. Another found that nearly half its stock brought in less than five per cent of volume. Eliminating some items and handling others on special-order basis had little effect on volume but increased profits markedly. Tools and techniques of market research can help literally any company plan and control its sales on a fact-founded basis.

Budget Expenses—A budget of sales expenses may express your plan of action in dollars and indicate where corrective action may be taken. Budgeting expenses for each branch or territory is also helpful.

Graphing of break-even points is effective in controlling sales operations, especially when they can be tied to incentive compensation. Charts can reveal position and efficiency of individual sales divisions, show the level of activity required to cover operating costs, indicate where additional effort will yield greatest return and dramatize incentive compensation by tying it to the profitability of the branch.

Forceful Planning—Hit-or-miss sales control of the past decade and a half makes it mandatory for management to take aggressive steps to control costs of selling. If its efforts result in a more efficient, harder hitting, better equipped sales organization, management will have indeed found a needed white rabbit.

What do you know about your over-all sales effort?

1. Who are your customers and prospects in each territory?
2. What are total requirements of each prospect and customer?
3. What percentage of each customer's requirements or potential are you selling?
4. Which customers buy your complete line?
5. Which accounts are unprofitable to sell?
6. What is the month-to-month sales trend by salesman, branch, territory and product?
7. What customers have been added during the past quarter?
8. Which old customers have stopped buying? Why?
9. When did a salesman last call on each customer and prospect? What result?
10. When did each customer last buy? How much?
11. What are each salesman's sales-to-date as compared to his quota?
12. Which territories are too large for one salesman? Too small?

Discard these false assumptions!

Executives must recognize and challenge their own policies to determine whether or not they are based on fallacious assumptions, says C. W. Smith of McKinsey & Co., management consultants. "The sooner fallacious assumptions are recognized the sooner action can be started to stop the profit-dollar leaks which inevitably result from their acceptance." Here are six commonly held assumptions Mr. Smith believes can keep selling costs up and sales volume down.

1. "Our salesmen know all the best prospects and don't need to be told where to call for most profitable results."
2. "Our salesmen understand our sales policies and apply them uniformly."
3. "Salesmen eventually learn the best ways to sell if they stick at the job long enough."
4. "Our past sales are a sufficiently good yardstick for measuring our sales opportunity."
5. "Straight commissions are always a sound method of compensating salesmen."
6. "You can't forecast sales in our business or effectively co-ordinate sales with production."

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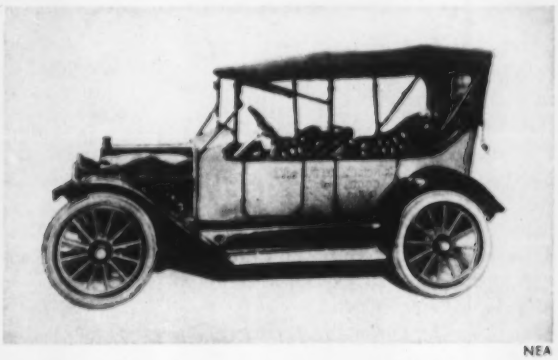
By FLOYD G. LAWRENCE *Detroit Editor*



NEA

Some 43 years of auto manufacturing add up to a . . .

Chevrolet Saga: More Than 30 Million Cars Since 1911

DETROIT

IF YOU'VE been watching the Fords go by, you probably know that about one car out of every four on the road today is a Chevrolet. But perhaps you didn't know that in 1921 Chevrolet came within an executive nod of being scrapped on the basis that it "could not hope to compete in its field."

As the Ford-Chevrolet sales battle moves toward first industrial use of the H-bomb, a look at the Chevrolet past might be in order. For, unlike the Ford story which most people learn about the time they start driving kiddie cars, the Chevrolet story is relatively unknown.

Wizard from Flint — Although Louis Chevrolet helped design the engine for the new car, the real Henry Ford of Chevrolet was William Crapo Durant, one-time Flint buggymaker whose financial wizardry helped found General Motors in 1908. The first Chevrolet, called the Classic Six, was assembled in March, 1911. A few months later the first plant of the Chevrolet Motor Co. was leased on West Grand Boulevard in Detroit.

Figuring importantly in the foundation of Chevrolet were Mason Motor Co., which built the engines, and Little Motor Car Co., both of Flint. Durant gave the Chevrolet name to the car, merged the two companies, moved manufacturing to the Flint Wagon Works in Flint and in 1912 turned out 2999 cars.

In a French Hotel—The Chevrolet Baby Grand touring car of 1914 was the first Chevrolet with a valve-in-head engine and carrying the familiar Chevrolet trademark. The trademark, incidentally, had its origin in a wallpaper design in a French hotel. Durant tore off a piece before the Chevrolet company was ever started thinking it would make a nice name plate for a car some day.

Reason for the adoption of the valve-in-head design is somewhat explained by an heroic effort on the part of some adman in 1914: "Gasoline is introduced directly into the cylinder head and exploded there. The full force of the explosion comes into direct contact with the piston head. For this reason Chevrolet power is maximum with minimum fuel." Since that time Chevrolet has built more than 30 million valve-in-head engines, more than the rest of the industry together, says the company.

Bid for Mass Market—It was in 1916 that the company decided to make its bid for volume production and the mass market. Up to that time the firm had priced its products slightly above the low-price class. With the "490", so-named because it was to sell for $490, the company entered the rough-and-tumble competition of the minimum cost field.

To avoid putting all its eggs in one basket, the firm introduced a new 90-degree V-8 in 1917 and a Chevrolet 490 five-passenger sedan with removable window posts that distinctly portends the modern hardtop. But Chevrolet manufacturing was moving with product design.

Expanding?—In 1913 an assembly plant was leased in New York with the Maxwell Motor Co. plant purchased for assembly in Tarrytown, N. Y., in 1915. The Gardener Buggy Co. of St. Louis was licensed for assembling cars in 1915 also, and in 1916 the firm opened the auto industry's first assembly plant on the West Coast at Oakland, Calif. The firm purchased the Warner Gear plant in Toledo that same year, and a new axle plant was added in Flint a year later.

During the Chevrolet debut, as a GM Division in 1919, production reached 149,904, but in 1921 production dropped to 76,370 and it was then that the recommendation was made that the Chevrolet operation be liquidated. Alfred P. Sloan Jr., assistant to the GM president at the time, took this as

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a challenge, and only five years later Chevrolet gained first place in the auto industry production-wise.

These and Those—Contributing to that rise were further mechanical improvements like those adopted in 1925 when production first exceeded 500,000 units annually: A vision ventilation windshield for all closed models, a new 11-inch brake, a new single dry plate clutch and the banjo-type rear axle. In 1928 the firm carefully lengthened the chassis four inches, setting the stage for introduction of the venerable Chevrolet-Six engine a year later. This 1928 series also began the glamour color treatment, reports the company.

During the Twenties, Chevrolet acquired facilities in Janesville, Wis.; Buffalo; Norwood, O.; Atlanta; and Kansas City, Mo. It opened a pressed metal plant in Flint, added a gray iron foundry in Saginaw, expanded in Indianapolis and in Detroit took over the GM Truck Corp. plant to manufacture Chevrolet front and rear axles and erected a new spring plant. It was in 1927 that the company first reached production of over 1 million cars per year, achieving first place in industry production.

Brief Respites — During the 1930s Chevrolet held first place except for "brief periods during 1930 and 1935," introducing such features as knee-action and the Blue Flame combustion chamber, both new on 1934 models. Although production was to fall to a low of 394,000 units during 1932, the firm averaged 1 million units a year for the next seven years with plants added in Baltimore; Saginaw, Mich.; Muncie, Ind.; Indianapolis; and Tonawanda, N. Y.

The World War II and postwar years are relatively recent chapters in the Chevrolet story. After turning out 8 million shells and 60,000 Pratt & Whitney engines among other war materiel, Chevrolet passed its first 2-million-unit year in 1950 and came close to repeating in 1953 with 1.9 million units.

Thus, from the first Chevrolet produced in 1911 to a certain unit produced late in 1953, 30 million Chevrolets have been manufactured. And that's a large barnful of horsepower in anybody's country.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,249	684,843
June	623,732	713,778
July	543,797†	757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,846

Week Ended	1954	1953
July 10	106,169	167,560
July 17	130,763	175,599
July 24	129,582	172,874
July 31	130,917	168,267
Aug. 7	123,611	137,671
Aug. 14	120,000*	156,526

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

General Tire Bids for MPC

General Tire & Rubber Co. has offered to buy control of Motor Products Corp., Detroit producer of auto parts and appliances. General Tire's offer is to buy 300,000 common shares at a price not to exceed $7 million. The bid has yet to be approved by Motor Products directors and stockholders. Motor Products is one of General Tire's customers, buying mechanical rubber goods made at the rubber company's Wabash, Ind., plant.

Hard Choice in South Bend

The situation in South Bend, Ind., was a miniature nightmare of all the worst things that could happen to the U. S. economy.

Studebaker Corp. was having trouble selling its cars, had even sold them below cost in an effort to boost sales and keep employees at work. The price-snipping had resulted in an upsurge of business, with June deliveries 69 per cent ahead of May. But Studebaker management was first to recognize that this practice could not be continued for very long so it had asked Studebaker employees to accept a 14-per-cent wage cut.

Actually the pay cut which UAW-CIO Local 5 in South Bend, Ind., was being asked to take amounted to the removal of the incentive or piecework pay system such as the Willys Local 12 in Toledo, O., had voted to forego last April. In addition to the pay cut, Studebaker employees were also being asked to take a reduction in the night shift premium pay and reduction from triple time to double time for holiday work. Workers were to get a full union shop and the first arbitration clause to be included in a Studebaker contract, improved vacation pay for workers with more than 15 years' seniority and the company to pay group insurance premiums for workers during model changeover layoffs for six weeks instead of four.

All that didn't set too well with Studebaker workers because for one thing employment had been dropping steadily from a year ago when 21,000 workers were engaged. In September, 1953, that figure dropped to 15,000; to 12,000 in February, 1954. The workweek was down to four days for the 12,000, with the plant operating usually one-week-on, one-week-off since February. From South Bend came stories of foreclosures and repossessions. The workers rejected the pay cut.

Finally, the company, in the first serious rift in labor-management relations with the South Bend union, told Local 5 in a letter that it "has no other course to take than termination of the contract" in 60 days. In the letter, Harold Vance, Studebaker president, and Paul G. Hoffman, Studebaker chairman, left the door open for future negotiations with the union.

The company seemed faced with three alternatives: 1. The union members could change their minds, accept the pay cut; 2. Studebaker could transfer its passenger car manufacturing operations away from South Bend to some other city, probably the Packard Motor Car Co. assembly line on Grand Boulevard in Detroit; or 3. Studebaker could shut down its passenger car production indefinitely.

DIE CAST ZINC

for DUMORE

Here's Why.....

Since the above part is the largest single component of the pictured Dumore automatic drill head, the selection of material and process for its production was of paramount importance in achieving high efficiency and low cost of the finished product. The following factors dictated the choice of ZINC Die Casting:

Rapid Production—Because of the extreme complexity of shape and close tolerances attainable with ZINC Die Castings, an absolute minimum of secondary operations—burr removal, drilling, tapping, burnishing—are required to place this housing in service.

Low Cost Assembly—In addition to housing the entire motor assembly, compressor and return spring (see cutaway view), this hollow one-piece ZINC Die Casting has cored openings and cast projections to simplify assembly of all other operating components.

High Strength—A drill head comes in for a lot of abuse in its everyday usage and the inherent *toughness* of the ZINC Die Cast housing assures trouble-free performance of this machine tool under such conditions.

For many other instances of successful product engineering with ZINC Die Castings ask us—or any die casting company—for a copy of "The End Uses of Zinc Die Castings."

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FOR DIE CASTING ALLOYS

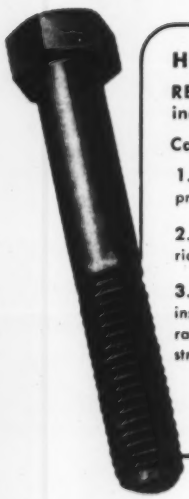
The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Sure, you'd need special cap screws here!

Some people have strange ideas on tightening cap screws.

Like the manufacturer we ran across recently. His workmen tightened cap screws far beyond their load limit as a matter of course. Naturally, this caused costly screw failures in the field. Also naturally, the boss figured the only way out was to buy expensive special screws with higher physical properties. Just in time, a sharp-eyed RB&W "fastener engineer" pointed out that a high-quality standard RB&W cap screw could do the same job — if the tightening method was corrected.

This incident spells out a cost-saving story for every user of fasteners. Maybe there's a stage in your operation where you're using a fastener designed for a bigger job than you're giving it. So it's important for you to know that an RB&W *standard* screw, nut or bolt can often give you the same dependable service you're paying extra for now. The facts in the box at right make it well worth a phone call to the nearest RB&W office to find out how these very special standards can do a job for you. RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y. 4.4



HERE'S WHY...

RB&W standards often surpass industry standards.

Cap screws, for example:

1. They're cold-headed — the process that produces the best bolts and cap screws.

2. Cold-heading requires superior materials — resulting in sounder products.

3. Modern equipment and quality control insures precise sizes, superior finish, accurate threading — for fast assembly and stronger end products.

4. RB&W cold-heads the widest size range in industry.

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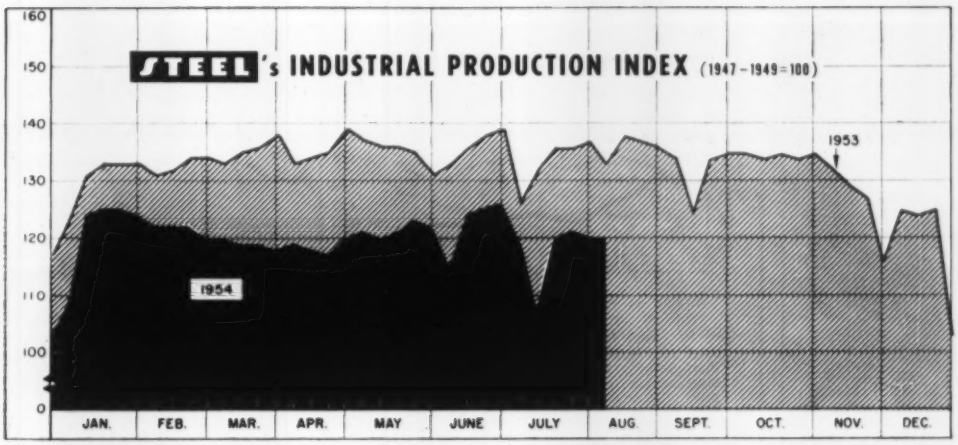
Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales agents at:* SEATTLE. *Distributors from coast to coast.*



LATEST WEEK*	120
PREVIOUS WEEK	120
MONTH AGO	107
YEAR AGO	133

* Week ended Aug. 7

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

Industry Gets a Smoother Ride on the Business Cycle

UNEMPLOYMENT is expected to be the big issue in the fall political campaigns. The only trouble is that by election time, much of that problem may have disappeared.

Employment has definitely leveled off. Even with the summer influx of students into the labor market, unemployment remained at about 3.3 million from May into July. The auto industry's model changeovers will add some to this total beginning about now, but September should see a decided pickup in job openings.

Glimmerings—Better conditions are showing up in many sections of the country already. Federal Reserve Bank of Boston says that the decline in general business activity appeared to come to a halt in New England during the second quarter.

New orders are coming in to manufacturers, especially those making consumer goods and construction materials. In the six weeks following May 15 insured unemployment decreased as much as it had increased in the preceding 20 weeks. There is still some liquidation of inventories, but slackoffs are being taken up by the construction and service industries.

Steady Rise — In Pittsburgh business activity rose for the fourth straight week. Increased power consumption, coal production, river traffic and new car registration are reported by Bureau of Business Research, University of Pittsburgh.

Cleveland's steel output slumped, but gains in other activities offset the loss. Over-all business in the area has been going up since April, says Federal Reserve Bank of Cleveland. The rate of layoffs has diminished considerably, but there will still be some lowering of employment until early next month.

Sunny California—On the West

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,519	1,527	2,146
Electric Power Distributed (million kwhr)	8,981[1]	9,139	8,464
Bitum. Coal Output (daily av.—1000 tons)	1,250	1,172	1,543
Petroleum Production (daily av.—1000 bbl)	6,258[1]	6,255	6,538
Construction Volume (ENR—millions)	$368.6	$262.3	$297.5
Automobile, Truck Output (Ward's—units)	123,611	130,523	137,671
TRADE			
Freight Car Loadings (unit—1000 cars)	678[1]	684	785
Business Failures (Dun & Bradstreet, no.)	201[1]	195	195
Currency in Circulation (millions)[3]	$29,893	$29,776	$30,139
Dept. Store Sales (changes from year ago)[3]	+1%	+1%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,234	$17,629	$16,518
Federal Gross Debt (billions)	$274.6	$270.8	$272.7
Bond Volume, NYSE (millions)	$20.0	$18.3	$12.2
Stocks Sales, NYSE (thousands of shares)	15,943	13,049	5,390
Loans and Investments (billions)[4]	$81.4	$81.1	$79.6
U. S. Gov't. Obligations Held (billions)[4]	$34.2	$34.0	$32.7
PRICES			
STEEL's Finished Steel Price Index[5]	194.19	194.19	189.38
STEEL's Nonferrous Metal Price Index[6]	215.6	215.4	205.0
All Commodities[7]	109.8	109.7	110.7
Commodities Other Than Farm & Foods[7]	114.2	114.2	114.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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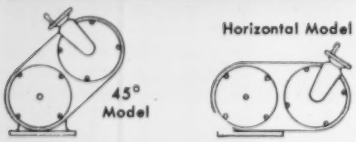
Fractional HP
Motodrive



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4. New horizontal or vertical down output shaft.
5. New spiral groove lubrication.
6. 112 different assemblies to choose from.

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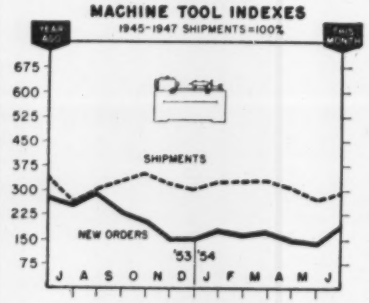
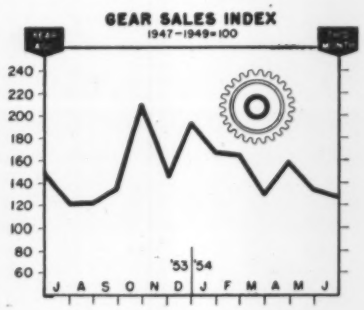
THE BUSINESS TREND



	New Orders		Shipments	
	1954	1953	1954	1953
Jan.	173.5	255.8	319.4	361.6
Feb.	159.8	282.1	323.1	354.5
Mar.	169.6	327.0	327.2	375.9
Apr.	142.8	276.8	302.7	372.7
May	139.5	246.4	270.3	356.0
June	186.8*	273.4	277.8*	342.2
July	....	247.3	....	267.6
Aug.	....	286.9	....	299.6
Sept.	....	223.7	....	328.3
Oct.	....	198.7	....	348.4
Nov.	....	146.6	....	320.2
Dec.	....	149.8	....	301.4

* Preliminary
National Machine Tool Builders' Assn.



	1954	1953	1952
Jan.	167.4	161.4	670.6*
Feb.	165.1	188.1	539.5*
Mar.	128.6	158.9	517.1*
Apr.	158.2	217.1	478.7*
May	132.5	189.8	425.9*
June	127.4	146.5	452.3*
July	....	120.7	145.3
Aug.	....	121.6	132.3
Sept.	....	135.6	143.4
Oct.	....	211.1	160.8
Nov.	....	144.9	150.9
Dec.	....	194.0	140.9

* (1935-39=100)
American Gear Mfrs. Assn.

Charts copyright 1954 STEEL.

Coast, the index of business activity of the Security-First National Bank of Los Angeles rose in June to the highest point in over a year. January was the low point. Construction is booming. Factory employment is holding steady. Total employment is going up and is less than 1 per cent under a year ago. There has been some small seasonal increase in unemployment.

Full Pockets . . .

One key to the economy's buoyancy is personal income which has risen steadily for several months. The annual rate recorded in June was $286.4 billion which compares favorably with last June's $287.3 billion.

Wages and salaries have leveled off with construction and retail trade making up for losses in durable goods industries, notably transportation equipment and machinery.

False Accusation? . . .

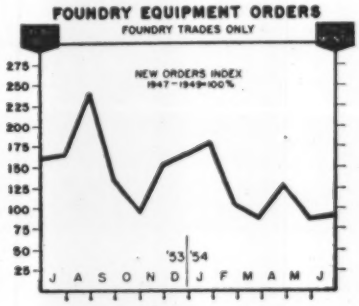
Inventory adjustment has become a much-maligned phrase over the past months, it having been used for want of a better explanation of the sag in the nation's business. Now that there are all kinds of talk of a coming upswing let's see just how far inventories went down.

The latest report by Office of Business Economics shows manufacturers' and trade inventories at $78.2 billion. This is $1.7 billion under a year ago, not much of a reduction when viewed as a part of the whole. But, nevertheless, it looks like the fall pickup will come on schedule. Three factors that are helping: Higher than expected sales; a pickup in new orders; good financial position of consumers.

Rising Barometer . . .

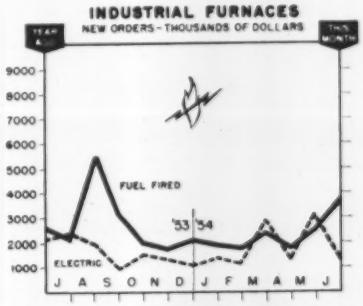
At least one of the so-called bellwether industries is already ringing out good news. Clifford M. Cook, president of the Metal Treating Institute says, "All our members in all parts of the country have been experiencing an upsurge since July 15." He predicts that American manufacturing is on the threshold of its greatest peacetime development.

Government propping in the fall will sustain the coming business improvement, says Henry H. Hei-



	Index (1947-1949=100)		Value Thousands	
	1954	1953	1954	1953
Jan.	173.8	99.6	$2,463	$1,418
Feb.	99.9	97.5	1,423	1,388
Mar.	82.7	132.2	1,089	1,882
Apr.	125.3	111.8	1,776	1,592
May	80.8	182.1	1,144	2,594
June	86.4	156.4	1,225	2,227
July	....	158.9	....	2,263
Aug.	....	235.5	....	3,353
Sept.	....	127.7	....	1,818
Oct.	....	87.1	....	1,241
Nov.	....	149.4	....	2,128
Dec.	....	160.8	....	2,290

Foundry Equipment Mfrs. Assn.



New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1954	1953	1954	1953
Jan.	1,865	3,540	1,374	1,655
Feb.	1,758	3,996	1,093	1,672
Mar.	2,346	3,607	2,828	1,301
Apr.	1,734	3,017	1,262	1,796
May	2,423	2,609	3,065	1,799
June	3,724	2,550	1,261	2,095
July	....	2,017	....	2,246
Aug.	....	5,465	....	1,904
Sept.	....	3,019	....	873
Oct.	....	1,975	....	1,539
Nov.	....	1,692	....	1,256
Dec.	....	2,013	....	1,014

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

mann, executive vice president of the National Association of Credit Men. He sees a coming upswing in inventories, peaceful labor scene and high construction and consumer spending. He says 1954 will be "a good year, far better than average in a competitive economy."

Leading the Way . . .

Electricity and construction continue to set records. For electricity it was the second in as many weeks. Southeast and South Central districts were the pace setters in the 9,139 million kilowatt-hours consumed in the week ended July 31, according to Edison Electric Institute. Central Industrial was the only district showing less use than a year ago.

Seasonal rises in construction expenditures in July set a record for the month of $3.5 billion and for the first 7 months of $20.1 billion. A joint report of Commerce and Labor departments shows new highs for private construction, commercial building, churches, schools and sewer and water facilities.

Private housing, public utilities and highways were also at peaks.

A Good Week . . .

The week ended Aug. 5 was the third largest this year for contract awards, says *Engineering News-Record*. Gains in private industrial building boosted the figure out of a recent dip.

All of this is in the face of sharply increased building costs. Price increases in all the "big three" materials—structural steel, lumber and cement—plus wage raises, have pushed costs up about 5 per cent over a year ago.

Trends Fore and Aft . . .

Independents are getting a smaller share of the truck as well as the auto market. Their share is down to 20 per cent this year from 25 per cent in 1953 and 30 per cent in 1952, according to *Ward's Automotive Reports*. . . . Sales of radio and television during second half will better the same period of last year, says Glenn W. Thompson, president, Arvin Industries. For the whole of 1954 he predicted higher unit sales but lower dollar volume because of lower prices. . . . It won't be long before half of the families in the country have TV if the trends shown in an Admiral Corp. survey continue.

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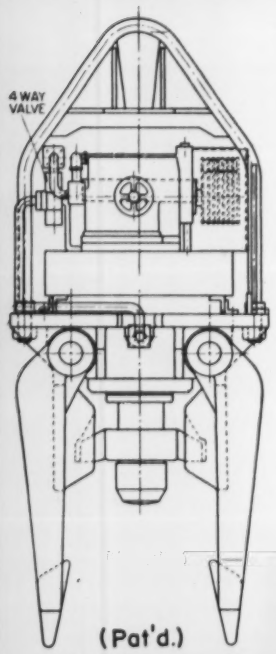

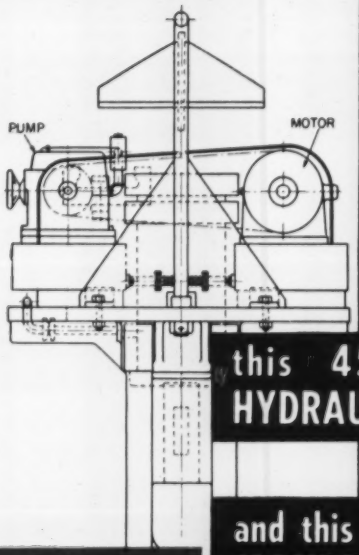

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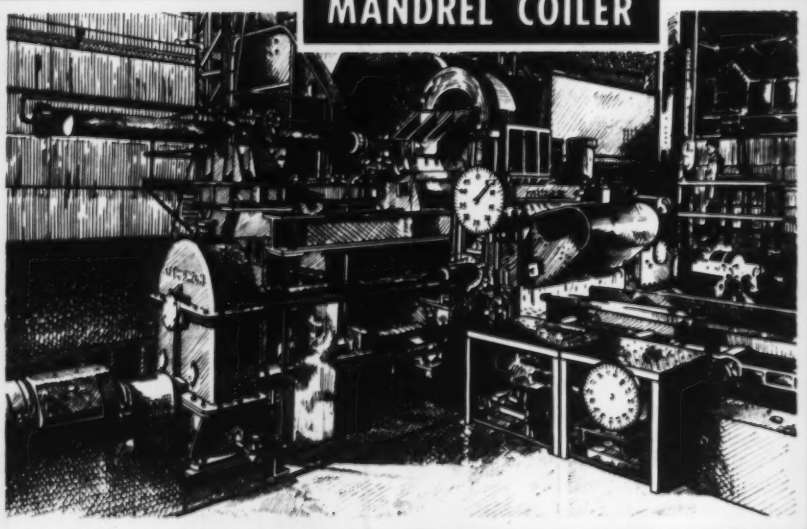
and this HOT STRIP MANDREL COILER



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CARL F. BARCHFELD
. . . *Crucible Steel Casting sales mgr.*

FRED W. EMHARDT
. . . *Struthers Wells chief engineer*

ARNOLD J. BEYER
. . . *chief engineer Gary Steel Works*

Carl F. Barchfeld joined **Crucible Steel Casting Co.**, Cleveland, as sales manager. He formerly was associated with Commercial Steel Casting Co.

Paul H. Startzman was elected executive vice president, **Oliver Iron & Steel Corp.**, Pittsburgh. He was formerly vice president-operations. **L. E. Ehrich** was named secretary and assistant treasurer to fill the vacancy created by **James C. Beech**, resigned. **James H. Mayberry** was elected assistant secretary and controller. **Henry V. Blaxter Jr.** was elected a member of the board.

Arthur J. Burke was named vice president in charge of manufacturing, **Barcalo Mfg. Co.**, Buffalo. He formerly was general works manager for Redmond Co. Inc.

Joseph E. McLaughlin, fabricating division staff assistant for **Aluminum Co. of America**, Pittsburgh, was named works manager at Alcoa's New Kensington, Pa., operations. He succeeds **John L. Patterson** who was promoted to assistant general manager of the fabricating division in Pittsburgh.

Phoenix Mfg. Co. appointed **Donald F. Stone** as sales manager for **Phoenix Steel Supply Co.**, Joliet, Ill. He was formerly product manager of United States Steel Supply Co., U. S. Steel Corp.

Fred W. Emhardt was appointed chief engineer, Warren division, **Struthers Wells Corp.**, Warren, Pa. He was assistant manager of the process equipment department.

Alfred E. Kadell was elected senior vice president, **Great Lakes Steel Corp.**, Detroit, subsidiary of National Steel Corp. Since 1953 he has been general superintendent of Weirton Steel Co.

Richard H. Schellschmidt was appointed national field sales manager, **Porter-Cable Machine Co.**, Syracuse, N. Y.

H. Douglass Moulton was elected president of **United States Steel Homes Inc.**, Pittsburgh, subsidiary of U. S. Steel Corp. He succeeds **Gen. J. O'Brien**, resigned. Mr. Moulton served as assistant vice president-raw materials of U. S. Steel Corp. since 1952.

James H. Carmine succeeds **William Balderston** as president of **Philco Corp.**, New York. Mr. Balderston was named chairman of the board.

Oldsmobile Division, **General Motors Corp.**, Lansing, Mich., appointed **William E. Rasmusson** plant engineer. Formerly superintendent of maintenance and construction in the plant engineering department, he succeeds **John D. Dakin** who died July 9.

Arnold J. Beyer was promoted to chief engineer at **Gary Steel Works**, U. S. Steel Corp., Gary, Ind. He is succeeded as division superintendent of power and fuel by **John T. Seaman. Daniel E. Wise** was appointed project development engineer with headquarters in Pittsburgh.

J. L. DeDiemar, former Convair design specialist, joined **Resdel Engineering Corp.**, Los Angeles, as chief engineer.

Merlin A. Cudlip was elected acting president of **McLouth Steel Corp.**, Detroit. He has been vice president and treasurer of the corporation since 1937. **C. Thorne Murphy**, vice president and director of purchases, was elected a director of that corporation.

Herbert V. Kaeppel was elected vice-president, **Howard Industries Inc.**, Los Angeles.

Herbert A. Silven was named chief engineer of the grinding machine division **Norton Co.**, Worcester, Mass. **Russell P. Hook** was appointed machine development engineer and **B. Heinz Goehring** is the new product quality engineer.

General Electric Co., Schenectady, N. Y., appointed three men to managerial engineering posts in the locomotive and car equipment department: **Otto A. Keep** is man-

JOHN LAWRENCE
. . . Joy Mfg. Co. vice president

G. W. HOFSTETTER
. . . manager Ferro Corp. div.

C. L. THOMPSON
. . . sales manager for Buda Co. div.

ager of control engineering; **Richard Lamborn**, manager of motor engineering; and **Charles L. Reed Jr.**, manager of engineering administration.

Joy Mfg. Co., Pittsburgh, elected **John Lawrence** executive vice president. Mr. Lawrence joined the company in 1951 and for the last year has been vice president of manufacturing and engineering.

Detroit Stamping Co., Detroit, promoted three men: **Harry C. Robeson**, former factory manager, was advanced to sales manager, stampings division; **Herbert S. McMillan** was named assistant sales manager, stamping division; and **Dominic J. Damm** was appointed factory manager.

Thomas F. Hannon was named general sales manager, **Manitowoc Equipment Works**, Manitowoc Co. Inc., Manitowoc, Wis. Mr. Hannon was formerly vice president and general manager of Ryan Refrigeration Co.

G. W. Hofstetter was named manager of Ferro Frit & Glaze Division, **Ferro Corp.**, Cleveland. He takes over this post after ten years as manager of Ferro's midwest sales division.

Lynn R. Parrish, vice president and regional branch manager, Aurora Pump Co., will head the sales force for that company in **New York Air Brake Co.'s** newly created combined sales office in New York. **William Chester** will represent the company's Kinney division as branch manager and **William Amory** will handle the Eastern territory for both the Dudco and Hydreco divisions.

Buda Co., Harvey, Ill., a division of Allis-Chalmers Mfg. Co., promoted **C. L. Thompson** to sales manager of the material handling division. He joined the firm in 1952 and has been general manager of the Oregon branch of Buda Co.

Joseph F. Whitaker was appointed vice president in charge of sales, **Weller Electric Corp.**, Easton, Pa. He joined this firm last year as sales manager.

R. D. Cleaves, former sales manager for Line Material Co.'s protective and power switching equipment division, was appointed general sales manager, **Anderson Brass Works**, Birmingham.

Pittsburgh Steel Co., Pittsburgh, promoted **H. L. Mills** to assistant district sales manager, Chicago district sales office. Mr. Mills has been a salesman with Pittsburgh Steel since 1951.

John J. Maloney was appointed superintendent of the salvage department at **Kaiser Steel Corp.**, Fontana Works, Fontana, Calif.

C. A. Roberts Co., Franklin Park, Ill., announced the retirement of **Clarence T. Johnson**, sales manager of the Chicago area. Mr. Johnson has been in sales with this company for 35 years. **John W. Gibb** will succeed him as sales manager in that area.

George A. Cunningham was named district manager of **Rockwell Mfg. Co.'s** newly opened meter and valve division, Charlotte, N. C.

Clevite Corp., Cleveland, elected **Herman L. Weckler** to the position of general manager. Since 1953 his duties were vice president-operations of Clevite.

General Motors Corp., New York, announced the retirement of **Harry J. Klingler**, vice president and group executive in charge of the passenger car divisions, effective July 31. Mr. Klingler is also retiring as a director of General Motors.

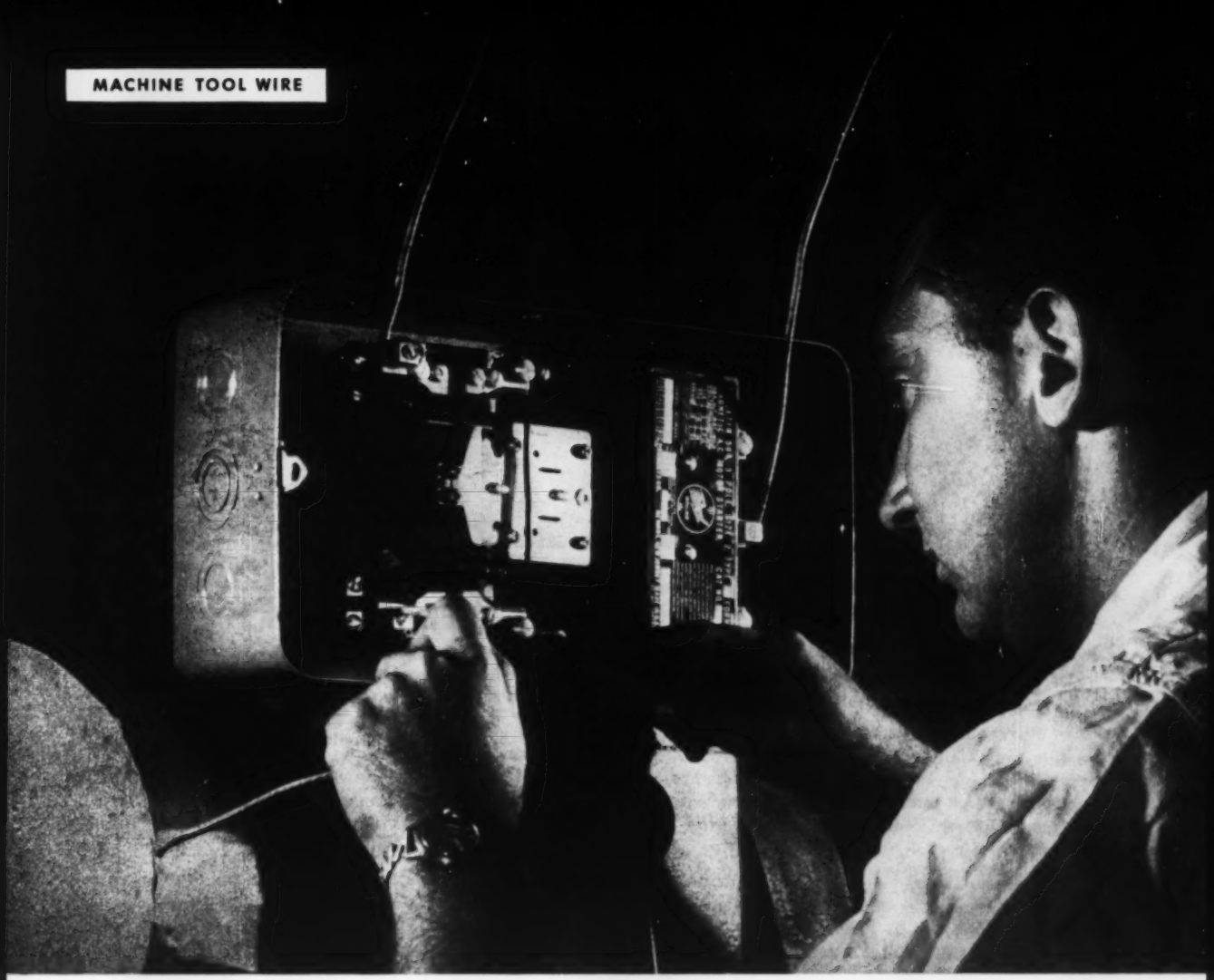
Leonard F. Crowley was named merchandising manager of **Jorgenson Steel Corp.**, Los Angeles steel warehouse.

Dr. Harold E. Zahn was appointed director of research, **Gould-National Batteries Inc.**, Depew, N. Y. He joined the company in 1949. Dr. Zahn succeeds **Dr. Eugene Willihnganz** who was named engineering staff consultant.

George S. Trimble Jr. was elected vice president in charge of the newly created advanced design division of **Martin Aircraft Co.**, Baltimore.

E. L. Krieble is appointed assistant director of research for **Barium Steel Corp.'s** subsidiaries: Central Iron & Steel Co., Harrisburg,

MACHINE TOOL WIRE



ANACONDA MACHINE TOOL WIRE has a specially-compounded vinyl resin insulation . . . assures long dependable service . . . makes installation easy.

Are you profiting from all these advantages of plastic-insulated machine tool wire?

Insulation "makes" a machine tool wire. That's why Anaconda has engineered a *special* vinyl resin compound for the job. This dependable, long-lasting material—called Densheath*—resists every known enemy of machine tool wire.

Oil mist set up by a milling machine has no adverse effect on Densheath. Nor has vibration in a broaching machine . . . the coolant on a grinding machine . . . metallic dust and dirt around a lathe.

Densheath wire is slim, flexible. Its small size saves space. And it's easy to install: it strips clean with a knife; built-in, *permanent* color coding simplifies tracing.

Flame-resistant? Of course. It will not burn nor support combustion.

And its quality is typically Anaconda! The latest equipment, rigid product control, selected materials assure you of *uniform* high quality product with every order. To order, or for more information, call your Anaconda Salesman or Distributor. He can also give you full information on Anaconda control cable and portable cord that you may need. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 54382

*Reg. U. S. Pat. Off.

DENSHEATH
MACHINE TOOL WIRE

ANACONDA®

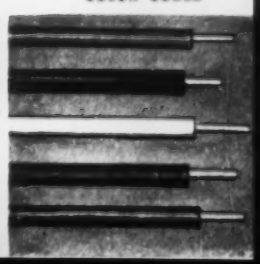
RESISTS OIL

RESISTS MOISTURE

STRIPS EASILY

FLEXIBLE

COLOR CODED



F. KENNETH IVERSON
. . . chief metallurgist Cannon-Muskegon

JAMES W. DICKEY
. . . president Ohio Hoist and Alcaloy

JULES F. FRITTS
. . . Mercer-Robinson executive v.p.

Pa.; Phoenix Iron & Steel Co., Phoenixville, Pa.; and Chester Blast Furnace Inc., Chester, Pa.

Cannon-Muskegon Corp., Muskegon, Mich., appointed **F. Kenneth Iverson** as chief metallurgist. He formerly served as metallurgist on special assignments for Indiana Steel Products Co.

Paul W. Moehle was appointed West Central region manager for **Detrex Corp.,** Detroit. In addition to his new duties, he will continue to serve as national accounts manager.

Lukens Steel Co., Coatesville, Pa., promoted **J. Louis Irwin** to director of the industrial relations division. He succeeds **William C. Robinson,** who will serve in an advisory capacity to the director of industrial relations. **Thomas J. Ryan** will become manager of labor relations.

James W. Dickey was elected president of **Ohio Hoist & Mfg. Co.,** Cleveland, and of **Alcaloy Inc.,** Trenton, N. J.

Alfred B. Babcock Jr. was named chief project engineer of **Borden Co.'s** chemical division, New York. He was formerly with the United States Atomic Energy Commission.

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed **Walter M. Gibbs Jr.** as sheet product manager, in the firm's Chicago general sales office.

George M. Nicholson was named assistant director of labor relations for **Westinghouse Electric Corp.,** Pittsburgh. **D. R. Hiestand** succeeds him as manager of industrial relations at GE's aviation gas turbine division in Kansas City, Mo.

Jules F. Fritts joined **Mercer-Robinson Co. Inc.,** New York, as executive vice president. He was formerly works manager with Philadelphia Gear Works.

John E. Sixt is promoted to sales manager, **Winsmith Inc.,** Springville, N. Y. **Richard E. Feldman** will succeed Mr. Sixt as assistant general manager.

I. B. Purdy was named vice president **Merritt-Chapman & Scott Corp.,** New York. He is responsible for administration of the company's industrial and building construction division.

William C. Lee was named assistant sales manager, replacement products, at **AC Spark Plug Division,** General Motors Corp., Flint, Mich. Since 1953, he has served on special assignment in replacement sales office.

OBITUARIES . . .

John H. Castle, vice president and production manager, **Wilmot Castle Co.,** Rochester, N. Y., died July 28.

Edward B. Pollister, 70, retired president, **Busch-Sulzer Division,** Nordberg Mfg. Co., St. Louis, died July 28 at his farm home in Elk Rapids, Mich.

Robert L. Johnson, manager, pump department, **Fairbanks-Morse & Co.,** Cleveland, died July 31. He had been associated with the firm for 30 years.

Frederick L. Rickmeyer, 44, chief engineer, **Swartwout Co.'s** ventilation division, Cleveland, died July 17.

John L. Pendry, purchasing agent, **Eaton Mfg. Co.,** Cleveland, died Aug. 3.

Joseph D. McNutt, 59, superintendent of explosives and director of the technical control laboratory of Winchester arms and ammunition division, **Olin Industries Inc.,** New Haven, Conn., died Aug. 2.

Willard J. Fostler, 52, general superintendent, **Excel Industries,** Clarence, N. Y., died July 30.

Rodney Penoyer, 66, retired vice president, **Hyman-Michaels Co.,** Chicago, died Aug. 1. He retired in 1952.

Ledyard Cogswell Jr., 76, chairman, **Pittsburgh Tube Co.,** Pittsburgh, died July 30 at his home in Albany, N. Y.

The significant results of

THE FIRST 120 DAYS OF TOOL-LEASE

A report by Francis J. Trecker, President, Kearney & Trecker Corp.

JUST four short months ago — as this is written — Kearney & Trecker demonstrated again its leadership in the machine tool industry by pioneering a program, unique among machine tool manufacturers, whereby its products might be obtained on a lease basis, as well as by outright sale or conditional sales agreement.

The results of the Kearney & Trecker TOOL-LEASE program have exceeded even our most optimistic forecasts. It has been a great stimulant of inquiries and new business, particularly where the replacement of worn and obsolete milling and precision boring equipment has been under consideration.

At this time the TOOL-LEASE program has been responsible for several million dollars' worth of new business. The success of this program is ample evidence that our decision to lease was founded on a correct appraisal of the needs of metalworking industry for some way to modernize its plant equipment without delay where working capital for the moment must be used for other purposes. In this respect TOOL-LEASE is serving a practical and useful purpose, and we are both pleased and grateful for the acceptance this program has been accorded.

The Kearney & Trecker TOOL-LEASE program today is an integral part of our company's general sales policy. The soundness of the program is evidenced — not only by the 120 day record of leases made by large and small companies alike — but also by the many complimentary letters received from leading figures in almost every executive capacity in business and industry.

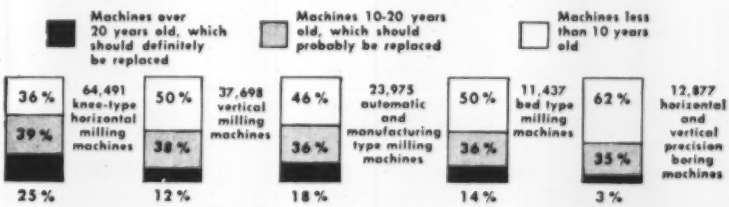
Today our sales organization is fully prepared to explain the details of the Tool-Lease program to anyone interested. Briefly, it offers a choice of three basic plans with varying options to continue the lease, terminate the lease or purchase the equipment.

FRANCIS J. TRECKER, *President*
Kearney & Trecker Corporation

Among the proved advantages of Tool-Lease are: Releases working capital for production expansion. Assures you the services of a machine as long as needed, avoiding risk of obsolescence. Permits user to judge machine's merits in actual shop performance without going to expense of purchasing the machine.

We invite your letters of inquiry. For complete details on Tool-Lease including actual costs . . . for prompt service and assistance in analyzing your plant modernization problems — contact the Kearney & Trecker sales representative in your area.

Milling and Boring machine obsolescence is CRITICAL!
Overall picture in 16 basic industries shows more than 50% need replacement.



Figures adapted from 1953 McGraw-Hill survey of metalworking industry.

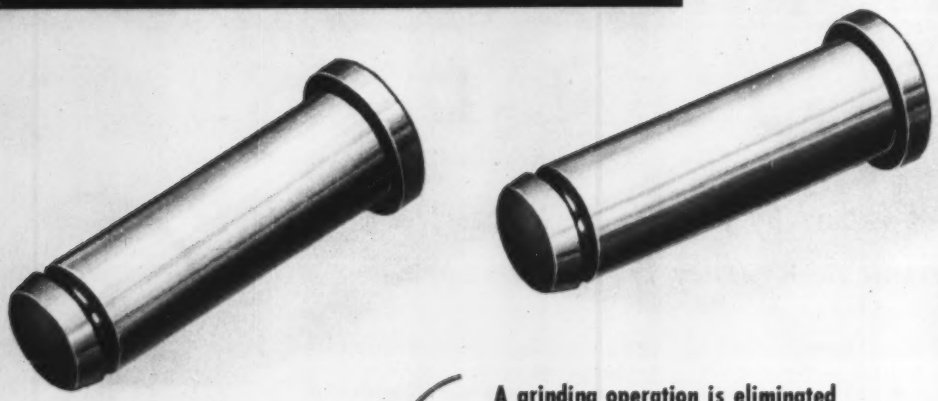
Ask for Tool-Lease Bulletin TL-10A and booklet titled "Critical Picture of Creeping Obsolescence." Write or call Kearney & Trecker Corporation, 6784 W. National Ave., Milwaukee 14, Wisconsin. Phone: GReenfield 6-8300.

Kearney & Trecker Corporation

builders of precision and production machine tools since 1899

©1954

2 Stainless Parts . . . *look alike*



but with 1 of them

A grinding operation is eliminated

Finish and accuracy to size are vital in fabricating this hinge pivot pin. When the Company used ordinary Type 303 Stainless, machined finish was poor and parts had to be ground before delivery. Then they made just one change . . . to Carpenter Stainless No. 8 (Type 303). Now finish is fine, size tolerances so close that final grinding is eliminated.

Part cost reduced 50%

When the change was made to Carpenter No. 8, things started to happen. All troubles previously encountered—including troubles with finish, tools and production, were cleared up. In fact, production has improved to a point that the Company makes an estimated saving of at least 50%. That's a saving worth having—especially when it can be done so easily.

Tool runs between grinds jump 100% to 200%

Before this shop switched to Carpenter Stainless, tools had to be reground every 8 hours or less. Now, they run 18 to 24 hours between grinds. It all adds up to more proof that the difference in stainless steels is Carpenter quality and uniformity. You can see the difference in speed, quality and profit in your own shop—when you specify "Carpenter" on your next stainless order.

Make the one change that counts . . .

change to *Carpenter* STEEL

Free-Machining Stainless

take the problems out of production

THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

For fast delivery, call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

Foundry Triples Capacity

Empire Steel Castings completes $800,000 expansion and modernization program

TO INCREASE casting capacity, an $800,000 expansion and modernization program has been completed at Empire Steel Castings Inc., Reading, Pa. M. G. Moore Jr., president, says the program doubles plant area and triples production capacity.

The foundry makes stainless, carbon, and low-alloy steel castings ranging in size from ½-lb to 2500 lb. The addition increases molding space by 100 per cent and provides a capacity of about 25 tons of castings daily.

New Facilities—The modernization program includes new sand storage bins, mechanized sand handling system, new electric furnace of 5 tons capacity, new core shop equipment, new monorail pouring system, entire new pouring area, new high production molding equipment, new shakeout unit and cleaning equipment, and a new conveyorized cleaning shop.

In addition to the extension of plant space and the installation of new equipment, rearrangement of facilities for melting, molding, coremaking, cleaning, heat-treatment and inspection resulted in straightline production flow and better, faster handling.

Modernization and rearrangement of operations into an orderly sequence through the foundry allows more room for inspection and testing. The company says it was one of the first plants to utilize a radioactive ampoule of cobalt wire for examination of castings for internal defects. In addition to gamma graphing, other testing methods in use are hydrostatic tests of valve bodies, mechanical tests for strength and ductility, magnafluxing for internal defects, and constant tests for correct sand mixture and quality control of mold and core sand.

Brass Firm Moves Branch

American Brass Co., Waterbury, Conn., completed installation of its district sales office in the Tishman building, 99 Park Ave., New York. Features of the new offices are the specially laid out work stations of steel that were organized and built by Art Metal Construction Co., Jamestown, N. Y.

Opens Alloy Products Shop

Sun Shipbuilding & Dry Dock Co., Chester, Pa., opened an additional shop for the fabrication of stainless steel products. For many years the firm has produced carbon steel pressure vessels, plate work, special machinery and many types of made-to-order equipment for industrial plants, oil refineries and chemical works. The firm also has produced many pieces of stainless equipment. This experience, officials of the firm say, convinced them that the proper way to fabricate stainless products is in a segregated shop. In this alloy products shop, the firm will fabricate all grades of stainless and alloy, clad steels and aluminum.

Wilton Tool Building Plant

Wilton Tool Mfg. Co. Inc., Chicago, is building a general office and factory building at 9525 Irving Park Rd., Schiller Park, Ill. The building will contain about 65,000 sq ft of floor space and will cost about $500,000. The firm produces manual and automatic vises, work positioners and c-clamps.

Pipe Firm To Fabricate Steel

United Concrete Pipe Corp., Auburn, Wash., is constructing an addition to its existing facilities to enable the firm to enter the steel fabricating field. The firm will install machinery for a wide variety of steel fabricating operations and will continue to conduct its pipe business. Thomas J. Larsen will have charge of steel fabricating.

Harvey Mfg. Changes Hands

Germanow-Simon Machine Co. Inc., Rochester, N. Y., purchased Harvey Mfg. Corp., New York. The former company makes precision temperature indicating products, household cutlery and automotive products, while Harvey makes small surface grinders and die-filing machines. Plans for Harvey call for continuance of the manufacturing operation in New York, as a subsidiary of Germanow-Simon. Addition to the line of machine tools is contemplated in the near future.

Next Step: Gunite

Worker welds reinforcing fabric in place on substructure of Prudential Insurance Co.'s office building being erected in Chicago. The fabric provides anchorage and bond between structural steel and fireproofing concrete to be applied from a gun in operation called the Gunite system

Dumas Steel Corp. Moves

Dumas Steel Corp. is moving its entire steel operation and offices to its new warehouse building at 19th and Noble streets, Sharpsburg, Pittsburgh 15. The firm furnishes warehouse services and stores flat-rolled steel as well as bars and structurals. It maintains a separate department for the processing of tin mill products, such as tin plate and black plate. Karl Adler, general sales manager, is in charge of the new warehouse.

Tecler Aluminum Formed

Berger Engineering Co. and Seattle Bronze Co. Inc., Seattle, purchased the property of Tecler Aluminum Products, that city, formerly owned by Kuney-Johnson Co., general contractor. The new owners have leased the property and fabricating business under the name of Tecler Aluminum. Aluminum windows, window walls and

(*Please turn to page* 86)

●DISCS cut fast...on the FASTCUT Pad 85 Assembly

NEW SAND SCREEN: Use both

TRADE MARK

SAND SCREEN by CARBORUNDUM is the new, open-mesh abrasive cloth for sanding and finishing that lets the removed material flow right through... instead of loading and glazing, as conventional abrasive paper and cloth do.

LASTS 7 TO 15 TIMES LONGER

Because it resists loading, and because you use *both sides*, SAND SCREEN sticks to its cutting job as much as 7 to 15 times longer than conventional abrasives. Both sides are uniformly coated with hard, sharp CARBORUNDUM® Brand Silicon Carbide abrasive grain for fast, easy sanding on metals, wood, paint undercoats and sealers.

USE IT WET OR DRY... BY HAND OR MACHINE

Use SAND SCREEN the same way you use your present paper or cloth—wet or dry, by hand or machine. For

Continually putting MORE SENSE in your ABRASIVE D

● CUT SHEETS fit your air or electric vibrating sander

● FOLD it like paper...TEAR it like cloth

sides...do from 7 to 15 times the work!

hand sanding, full 9" x 11" sheets fold like paper, tear like cloth to any width you desire. Cut sheets fit your oscillating or vibrating sanders. Discs give best results when used wet with CARBORUNDUM'S FASTCUT Pad 85 Assembly. Ordinarily, no adhesive is needed when sanding flats or slight contours... the surface of the FASTCUT Pad holds the disc in place. Full sheets, cut sheets and discs come in 180 and finer grit sizes.

WHERE WOULD YOU LIKE TO USE SAND SCREEN?

We will work with you to help you take full advantage of SAND SCREEN'S many advantages and cost-cutting features. Just tell us what operations you would like to test it on. Call your CARBORUNDUM Distributor or Salesman (listed under "Abrasives" or "Grinding Wheels" in the yellow pages). Or, if you prefer, write to us. Send the coupon for a sample and full details, anyway!

Send for Folder... use this Coupon!

THE CARBORUNDUM COMPANY, Dept. S 82-46
Niagara Falls, New York
Rush folder about new SAND SCREEN.

NAME _____ TITLE _____

COMPANY _____

STREET AND NUMBER _____

CITY _____ ZONE _____ STATE _____

CARBORUNDUM

REGISTERED TRADE MARK

82-46

(*Continued from page* 83)

all types of architectural aluminum work will be continued. Principals in the new organization are Walter Page, Ferdinand Schmitz Jr. and Phillips Dickinson.

Follansbee Unit Changes Name

Follansbee Metals is the new name for the former Follansbee Metal Warehouses, a division of Follansbee Steel Corp., Pittsburgh. The division maintains depots for metals in Pittsburgh, Rochester, N. Y., and Wallingford, Conn.

Inland Gets Safety Award

Inland Steel Container Co., New Orleans, a division of Inland Steel Co., Chicago, received the National Safety Council's award of honor for reducing its frequency and severity rates during 1953 from established par rates to zero.

Roebling Building Chair Lift

Bridge Division of John A. Roebling's Sons Corp., Trenton, N. J., a subsidiary of Colorado Fuel & Iron Corp., Denver, recently began shipping materials for a 6300-ft long chair lift on the south side of Spruce Peak, near Stowe, Vt. It will provide an uphill capacity of 800 persons per hour.

Latrobe Opens Warehouse

Latrobe Steel Co., Latrobe, Pa., opened its new warehouse at 5572 Brecksville Rd., Independence, O. Devoted exclusively to tool and die steels, it is the largest warehouse for this purpose in the Cleveland area. H. C. Burgess is manager.

Buys Bonsack Rights

West Engineering Co., designer and builder of special machinery, Richmond, Va., purchased from Bonsack Machine Co. Inc., Lynchburg, Va., the rights, including inventory, tools, patterns and drawings, to manufacture the Bonsack high-speed automatic feeder, the Jeep stemming machine, and the Astra cut-off machine.

Gear Business Changes Hands

Niles-Bement-Pond Co., West Hartford, Conn., which recently added to its plant in East Greenwich, R. I., announces further expansion. Through its Pratt & Whitney Division, aircraft parts and machine tool maker, the firm announced that its subsidiary, Potter & Johnson Co., Pawtucket, R. I., has taken over the manufacture of products formerly made by Newark Gear Inc., Newark, N. J. Products include gear hobbing machines, gear cutting machines, gear cutter grinding machines and attachments.

Builds Nail Plant Addition

Dickson Weatherproof Nail Co., Evanston, Ill., is building an addition to its plant in that city. The added space of 9000 sq ft will increase floor area by about 45 per cent. The new facilities are scheduled to be completed by October.

Ferro Expands on West Coast

Ferro Corp., Cleveland, will install two continuous smelters for the production of porcelain enamel "flake" frit and glaze in its Los Angeles plant. Supplemented by two rotary type smelters, currently being installed, these installations will completely modernize this plant in order to take care of Ferro's expanding West Coast business.

Enamelstrip To Enlarge Plant

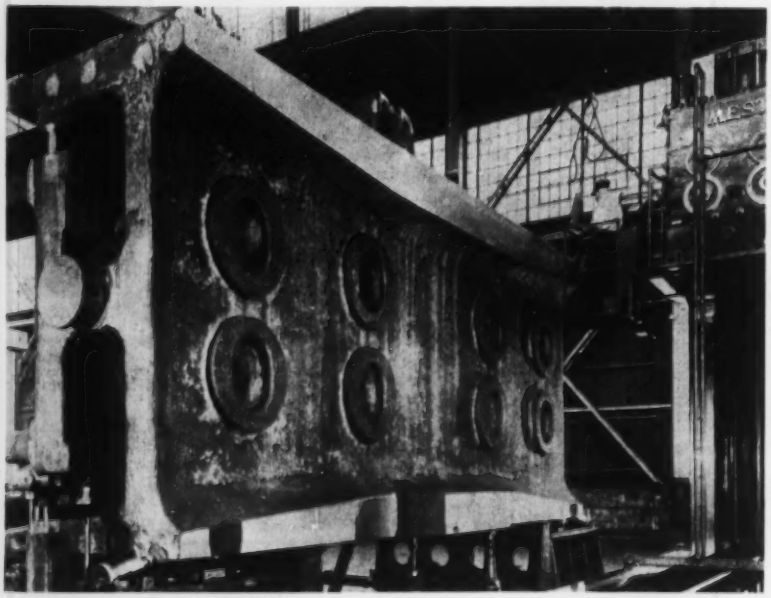
Ground-breaking ceremonies for the $300,000 addition to the plant of Enamelstrip Corp., Allentown, Pa., are scheduled for Aug. 11. This addition, which is expected to be completed by the end of 1954, will increase the firm's floor space by 48,000 sq ft.

American Can Expands in West

American Can Co., New York, has started construction of a lithographing and warehousing building adjacent to its Pacific factory in San Francisco as the latest in a series of recent expansion projects. The new structure will have a total of 340,440 sq ft of floor space, says C. W. Roberts, Pacific Division vice president.

AMF Buys Sight-Light Corp.

American Machine & Foundry Co., New York, will acquire Sight-Light Corp., Deep River, Conn., producer of electrical systems and ordnance devices for the United States Navy. Management of



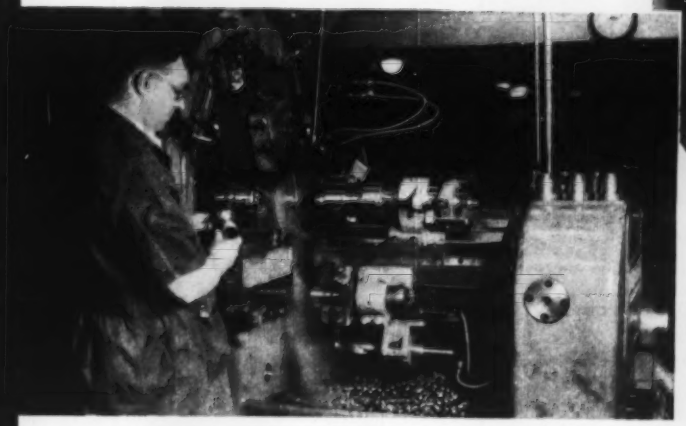
One Casting—596,000 Pounds of Steel

Here's a base section of the 50,000-ton hydraulic forging press being built by Mesta Machine Co., Pittsburgh, for the Air Force as it undergoes machining. The Mesta foundry poured about 596,000 pounds of steel to make the casting. The press is being installed at Alcoa's Cleveland plant to forge aircraft parts

Baker INDUSTRIAL TRUCKS tells us...

"we used to average 2 of these pieces per hour ...from 2 machines with 2 operators

now we get 10 pieces with just 1 machine and 1 operator..."



This commutator core, actual size, is completed in one set-up with HS tools. Close reaming, trepanning and class 3 thread are required.

. . . on the Model M Bar Type Acme-Gridley Automatic Turret Lathe

Another case-history report, this time from Baker-Raulang, Cleveland, O., one of the most experienced (101 years old) makers of power industrial trucks and tractors.

This 5 to 1 production gain is the average, though we can show you where and how other Model M customers are getting as much as 10 times their former output. And we believe that such down-to-earth documented evidence far outweighs vague promises, hearsay or experimentation at your expense.

May we give you more information, especially figures on your specific single spindle jobs? Why not let us show you what this machine actually has accomplished... with carbide tooling, easy change-overs, operating conveniences... performance facts that make such claims of highest output at lowest costs a REALITY?

If this bar machine offered ONLY

predetermined automatic control of the job time-cycle...

this complete machining of every piece at the same predetermined rate at the end of a shift as at the start would mean faster and more accurately scheduled production. But, when additional operations can be put on to complete the job, or more nearly complete it, on ONE machine—and eliminate present unnecessary added cost for extra man hours and release these extra machines and floor space to other needs—THEN certainly it is important that you have such guarantees to make comparisons on your own work.

The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing

Remember—You can't do **TODAY'S JOB** with **YESTERDAY'S TOOLS**... and be in business **TOMORROW**

Normal Traffic Gives Fabrications Right-of-Way

Special trailers solved transportation problems posed recently by unusually long fabrications. The 148-ft, 30-ton welded steel plate girder (top) is on its way from Independent Iron Works Inc.'s shop in Oakland, Calif., to the new San Francisco freeway. On the opposite coast, the 102-ft, 23-ton tank (bottom), one of the largest to travel over the highways, was made by Massachusetts Engineering Co., Quincy, Mass. It will be used for storage of jet fuel. The tank was made of ⅜-in. plate and was welded with Jetweld, a new iron powder coated electrode manufactured by Lincoln Electric Co., Cleveland

Sight-Light, consisting of Earl L. Canfield, president, and Charles S. O'Connell, secretary, will remain unchanged.

Tool & Die Firm Opens Plant

National Tool & Die Co. opened a new plant at 75 Airport Rd., Hartford, Conn. The company does fine precision work on gun parts for the aircraft industry. The new plant contains about 8000 sq ft of floor space.

Magic Chef To Sell Foundry

Magic Chef Inc., St. Louis, closed its foundry in Indianapolis and is offering it for sale, says Arthur Stockstrom, president. The firm plans to buy all of its castings from outside sources. The firm also plans to close its plant in Lorain, O., and transfer this production activity to its St. Louis plant. Magic Chef makes kitchen ranges, incinerators, room air conditioners and heating equipment.

Staveley To Buy Tool Works

Staveley Coal & Iron Co. Ltd. of England, holder of the majority of the shares in Standard Machine & Tool Co. Ltd., Windsor, Ont., completed negotiation for acquisition of the majority of issued capital shares of Modern Tool Works Ltd., Toronto, Ont. Standard Machine had announced previously its intention to erect a plant in the Preston, Ont., area. Acquisition of Modern Tool Works Ltd. will necessitate postponement of the Preston plant. Standard company will proceed with the building of a new factory in Windsor.

FMC Acquires Chicago Pump Co.

Food Machinery & Chemical Corp., San Jose, Calif., purchased Chicago Pump Co., Chicago, producer of sewage treatment and disposal equipment, water treatment equipment, and specialty pumps for building services. As a subsidiary of FMC, Chicago Pump Co. will be an operational component of the parent corporation's Peerless Pump Division and will continue to operate under the direct management of George D. Bers, president of Chicago Pump, and Milton Spiegel, vice president and general manager.

Autoparts Maker To Move

Thompson Products Inc., Cleveland, will transfer the operations of its affiliate, Toledo Steel Products Division, from Toledo, O., to Cleveland this year. Carl L. Kahlert, manager of this unit, says it will continue to operate as part of Thompson Products. The division makes automobile parts.

Salkover Opens New Plant

Salkover Metal Processing of Illinois Inc. moved into its new plant at 2550 Edgington Ave., Franklin Park, Ill., which has practically twice the floor area of the two plants formerly operated in Chicago and Melrose Park, Ill. The company is engaged in copper, silver and aluminum brazing and also handles bright, scale-free annealing.

ASSOCIATIONS

Don Larson, advertising director, Hoffman Radio Corp., Los Angeles, was named general manager of **West Coast Electronic Manufacturers' Association.**

William J. Matthews Jr., secretary-treasurer, American Zinc, Lead & Smelting Co., St. Louis, was elected secretary-treasurer of the St. Louis Control of **Controllers Institute of America,** New York. The following were elected directors of the institute's local controls in their respective areas: N. R. Althauser, Aluminum Co. of America, Pittsburgh; W. T. Brunot, Reynolds Metals Co., Richmond, Va.; W. J. Faust, Bridgeport Brass Co., Bridgeport, Conn.; F. G. Harris, Imperial Brass Mfg. Co., Chicago; F. S. Hatch, Moore Drop Forging Co., Springfield, Mass.; A. J. Lehmkuhl, Geuder

NOW for the first time!

RELIEF GRIND FORMED CUTTING TOOLS

QUICKLY • EASILY • ECONOMICALLY without Lengthy Calculations

THE REVOLUTIONARY NEW PRATT & WHITNEY Relief Angle Compensating

Diaform WHEEL FORMING ATTACHMENT

Here is the most important advance in the making of formed cutting tools in nearly a century! This new model DIAFORM Wheel Forming Attachment is equipped with the unique Relief Angle Compensator that works from a simple, **true-to-form** template to provide complete, accurate compensation for all front and side relief and top rake angles normally required . . . even when cutting aluminum alloys, plastics, wood etc. Lengthy calculations, trial-and-error, projection drawings and distorted templates are eliminated; important savings in time and effort are realized.

Operation is simple. The template (prepared to the **exact** contours and dimensions of the finished product multiplied 5X or 10X) is mounted on the carrier. This assembly, which is equipped with graduated scales, is tilted to the included angle of both the front relief and the top rake; for side relief, the carrier is swiveled to the desired angle. The operator has now only to follow the template with the tracer bar using the guide knob, and the truing diamonds form the grinding wheel accurate to "tenths" and correctly compensated.

TAKE ADVANTAGE OF THIS NEW SCIENCE IN CUTTER RELIEF GRINDING . . . SEND NOW FOR COMPLETE INFORMATION — Just fill in and mail the attached coupon . . . or write on your Company letterhead.

PRATT & WHITNEY

DIVISION NILES-BEMENT-POND COMPANY

WEST HARTFORD 1, CONNECTICUT, U.S.A.

BRANCHES IN PRINCIPAL CITIES

SINCE 1860

First Choice for *Accuracy*

MACHINE TOOLS • CUTTING TOOLS • GAGES

PRATT & WHITNEY — Div. Niles-Bement-Pond Co.

13 Charter Oak Blvd., West Hartford 1, Conn.

Gentlemen: Please mail my free copy of Circular No. 574 that gives complete data on the new P&W Relief Angle Compensating DIAFORM.

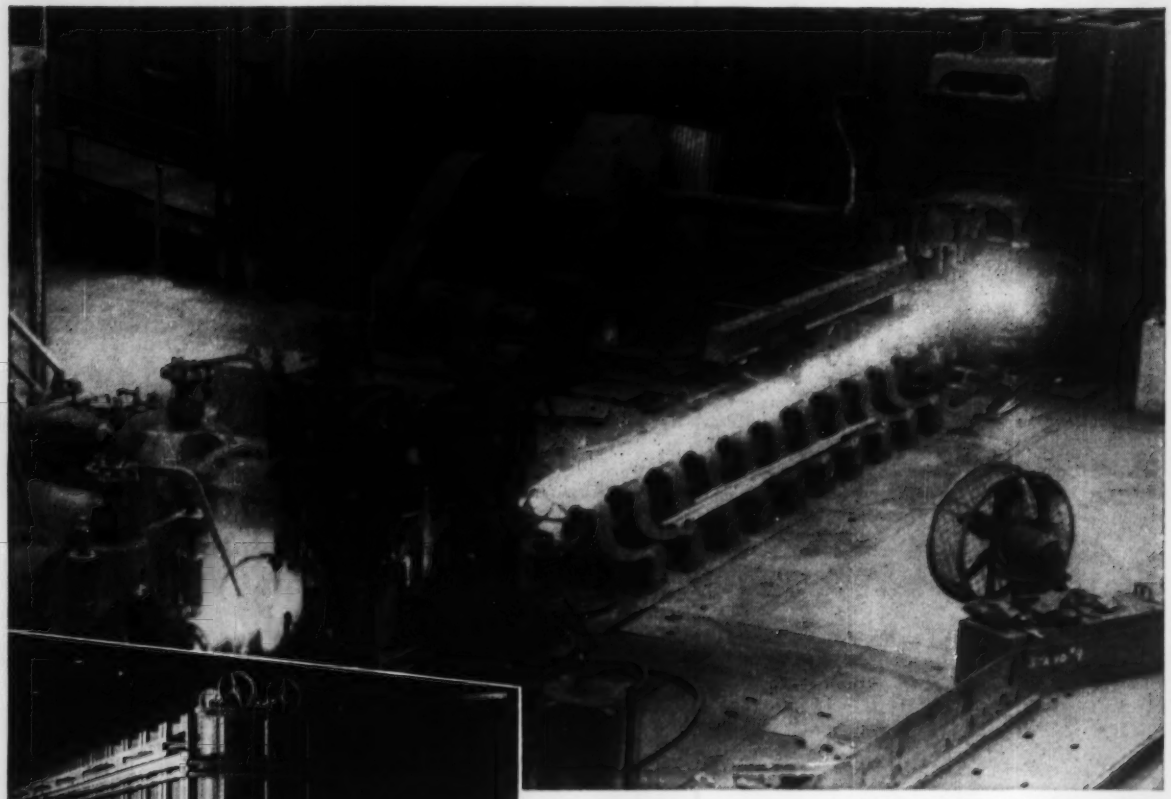
NAME _____

POSITION _____

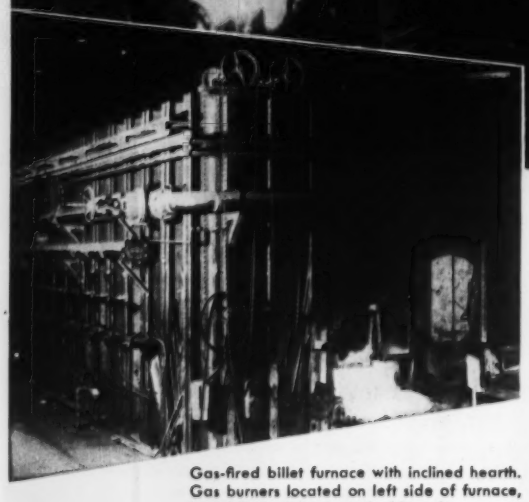
COMPANY _____

CO. ADDRESS _____

CITY _____ ZONE _____ STATE _____



Hot billet goes through first pass after discharge from Gas-fired billet heating furnace.



Gas-fired billet furnace with inclined hearth. Gas burners located on left side of furnace, heat billets at lower end of hearth.

GAS provides the accurate temperature control for precision heat processing at Sheffield Steel Corporation

No other industry conducts more heat processing operations than the steel industry, and the use of GAS in the many reheating furnaces and heat treating operations at the Sheffield Steel Corporation has contributed to lower production costs plus higher efficiency in their plants.

For instance, the Sheffield plant in Kansas City produces a great variety of products, from staples and bolts to hot rolled bars and shapes. Throughout their production, from the making of basic steel to the finished mill products, GAS plays a major role in maintaining the accurate temperature control required. All ferrous and non-ferrous metallurgical heat processing operations must be carefully controlled, for just a slight deviation from the required temperature may throw the final results way off.

Sheffield is typical of the modern industries which rely on the complete versatility of GAS. Modern Industrial Gas Equipment is designed to implement production-line techniques wherever heat is required in processing operations.

For more information on how GAS and Modern Industrial Gas Equipment is being utilized to increase the efficiency of heat treating production lines, consult your Gas Company Representative.

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK

Paeschke & Frey Co., Milwaukee; and C. G. Phelps, Wolverine Brass Works, Grand Rapids, Mich.

REPRESENTATIVES

Cushman Chuck Co., Hartford, Conn., manufacturer of air and manually operated chucks, appointed Frederick H. Fippinger as its New England representative.

American Nickeloid Co., Peru, Ill., maker of preplated metals in sheets and coils, closed its Detroit office and appointed Carl D. Lenz to service the territory from the firm's Chicago office. Marc F. Hermann, formerly of Detroit, is now in charge of the company's newly opened Philadelphia sales office.

Size Control Co., Chicago gage manufacturer, appointed Tool Engineer Products Co. Inc., Pittsburgh, as its representative for western Pennsylvania. Size Control is a division of American Gage & Machine Co., Chicago.

Cleaver-Brooks Co., Milwaukee, appointed Harold R. White Co., Baltimore, as manufacturer's representative for the sale of its boiler equipment.

Huck Mfg. Co., Detroit, appointed Turney & Beale, Bayside, N. Y., as its East Coast distributors; California Rivet Co., Glendale, Calif., as its West Coast distributor of self-plugging, pull-through and Deutsch commercial drive-pin blind rivets.

Dayton Pump & Mfg. Co., Dayton, O., appointed Robert N. Box, Laurel, Miss., and Wiley A. Jones, Atlanta, as distributors in their respective territories.

Whitehead Metal Products Co., New York, is now distributing nonmetal pipe and fittings, made by **Alpha Plastics Inc.**, West Orange, N. J. These products are made from B. F. Goodrich Chemical Co.'s Geon polyvinyl material.

Firth Sterling Inc., Pittsburgh, appointed the following distributors of its steel and carbide products; K. P. Wesseling Co., St.

Here's An Idea For Reducing Costs— Improving Products—Saving Time—

Use Cherry Blind Rivets

To reduce unit costs, save assembly time and improve product design may sound like a big order for a fastener but that's exactly what Cherry Blind Rivets are doing today for many manufacturers. This is the rivet that is installed by one man from one side of the work —economically and quickly. There is no bucking—no hammering—no twisting—no exploding. Cherry Rivets are used in double-surfaced structures, box sections, tubes, ducts, and other hard-to-reach places.

Several factors reduce unit costs. To begin with, one man is eliminated from the rivet crew. Also, material spoilage is reduced because Cherry Rivets are installed by a pulling action —the gun won't mar surfaces or shatter brittle materials with violent blows. Often jigs and assembly procedures are simplified when set up for Cherry riveting. Because the process is fast, units move quickly along assembly lines—bottlenecks are eliminated.

Designers specify Cherry Rivets because they are not hampered by blind spots—can employ modern contours and a wide variety of materials. This latitude enables them to improve product appearance and salability. Other advantages—they pull up tight, resist vibration, eliminate nuts, bolts, and washers—provide a tamper-proof fastening because they are permanent. Cherry Rivets are widely used in maintenance work too, since they often eliminate need to tear down entire areas of equipment to repair small sections.

For information on how you can use Cherry Rivets in your operations to reduce costs, improve products, and save time, fill in the coupon below or write for 12-page bulletin.

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

In Canada: *Parmenter & Bulloch Manufacturing Company, Ltd., Gananoque, Ontario*

TOWNSEND COMPANY
Sales Department
New Brighton, Pa.

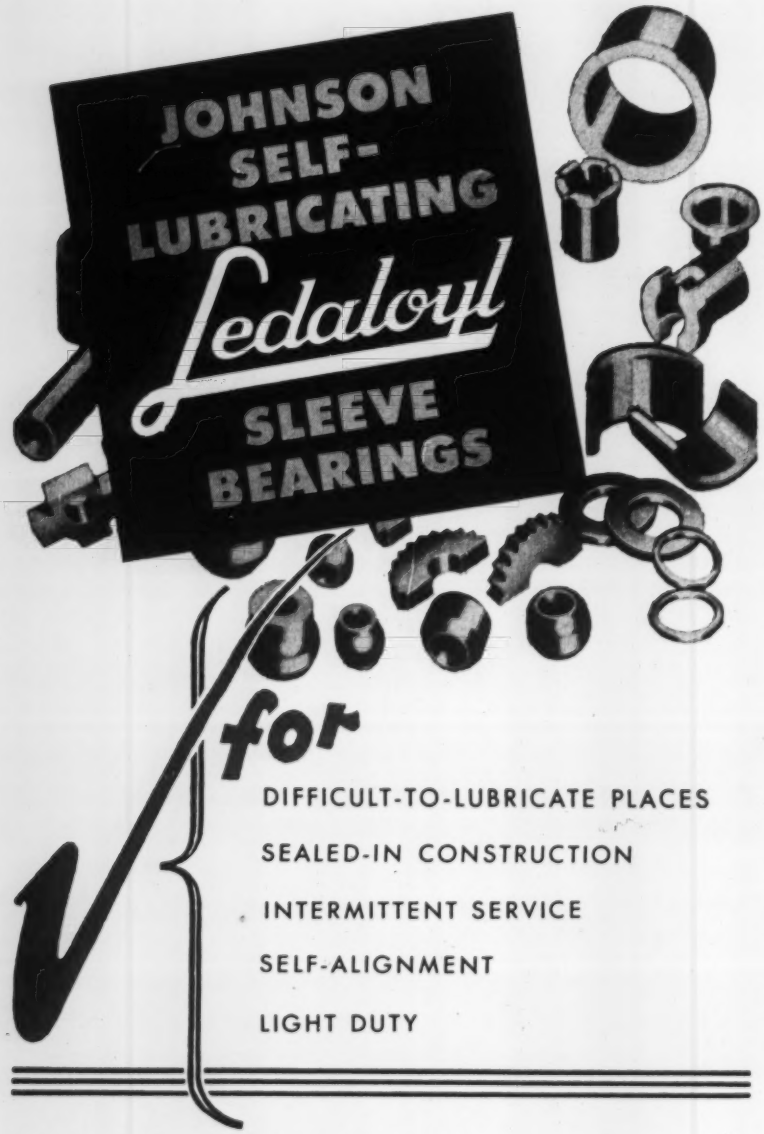
Please send without obligation Cherry Blind Rivet Bulletin TL-76.

Name _____ Title _____

Company _____

Street _____

City _____ Zone _____ State _____



for

DIFFICULT-TO-LUBRICATE PLACES

SEALED-IN CONSTRUCTION

INTERMITTENT SERVICE

SELF-ALIGNMENT

LIGHT DUTY

POWDER METALLURGY made possible this versatile bearing . . . molded pre-cast bronze alloy powder impregnated with oil for self-lubrication. Myriads of tiny, evenly spaced pores serve as miniature oil wells. When the bearing is in use the oil is metered to the shaft . . . when at rest, the oil is reabsorbed by the bearing. These Ledaloyl bearings are widely used for small motors and fans, and have wide acceptance for self-aligning applications. Their extremely low cost, (no machining necessary), makes them practical for use in many types of equipment where heavy duty is not a factor. A wide selection of plain, single flanged, double flanged and self-aligning Ledaloyl bearings is available from distributors' stocks, while special sizes and styles of bearings and parts can be made to order. Write for complete information.

JOHNSON BRONZE CO., 550 South Mill St., New Castle, Pa.

JOHNSON B BEARINGS
Sleeve Type

OTHER BEARING TYPES:
General Purpose (GP) • Electric Motor (EM) •
Graphited • Universal Bronze Bars • Babbitt

Louis; Cincinnati Supply Co. Inc., Cincinnati; Phoenix Steel Supply Co., Chicago; Noland Co., Chattanooga, Tenn., Norfolk, Newport News and Roanoke, Va., Birmingham, Atlanta and Washington.

Charles C. Atwell, heading his own company, C. C. Atwell Co., was selected by **Lavallee & Ide Inc.**, Chicopee, Mass., and **Threadwell Tap & Die Co.**, Greenfield, Mass., as manufacturer's representative.

American Machine & Metals Inc.'s DeBothezat Fans Division, East Moline, Ill., appointed S. S. Bratton Sales Engineers Ltd., Birmingham, as its sales representative in that territory.

Lewis-Shepard Products Co. Inc., Watertown, Mass., maker of materials handling equipment, appointed as sales representatives C. M. Jensen, Dallas, and Roger Brown Co., El Paso, Tex.

Helipot Corp., South Pasadena, Calif., maker of precision potentiometers, dials and electronic components, appointed Eltron Engineering Sales, Newtonville, Mass., as its sales representative for the New England states.

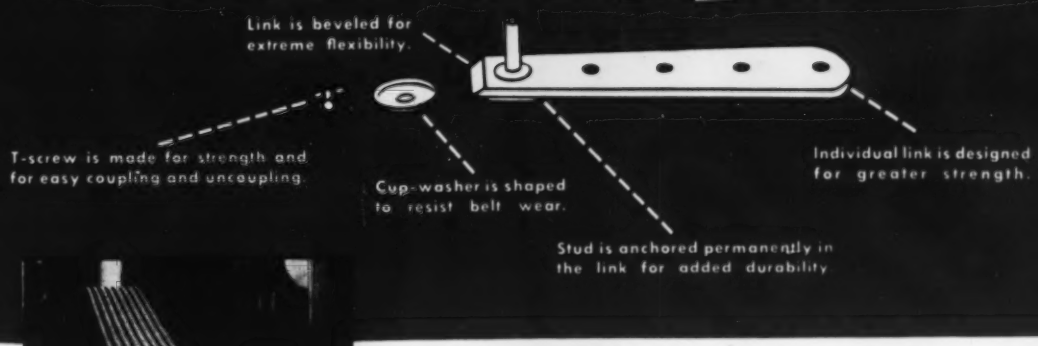
General Smelting Co., Philadelphia, was appointed a distributor of Kaiser aluminum ingot by **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. General Smelting is the first Kaiser Aluminum distributor to be named solely to handle ingot under a new policy established by the corporation.

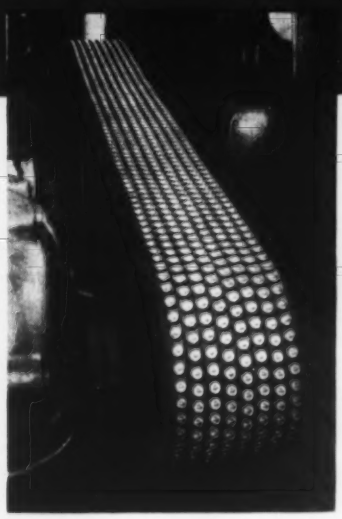
NEW ADDRESSES

Graton & Knight Co., Worcester, Mass., maker of industrial leather products, moved its Detroit branch office to 16146 Wyoming St. This office will serve also as a branch for **International Packings Corp.**, Bristol, N. H., a Graton & Knight subsidiary. Branch manager of the office is Robert C. Kerr.

Ross Sprinkler Co. moved its plant and offices to 4333 Temple City Blvd., Rosemead, Calif.

This detailed line drawing of the new, patented Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job . . . easier!


Link is beveled for extreme flexibility.
T-screw is made for strength and for easy coupling and uncoupling.
Cup-washer is shaped to resist belt wear.
Stud is anchored permanently in the link for added durability.
Individual link is designed for greater strength.



New VEELOS

TD and TE Adjustable V-belt

So easy to couple *it installs in minutes*

So strong and durable *it lasts for years*

The new Veelos TD and TE adjustable v-belt is the successful development of a specific v-belt designed for a specific service—D and E drives.

This new Veelos TD and TE v-belt has these basic advantages . . .

It simplifies installation. Links are quickly joined by easy-to-use cup-washers and T-screws to make up individual belts. It's the easiest v-belt to couple and uncouple ever developed. And you don't need to waste time removing outboard bearings.

It lasts longer—is more flexible. New high-tensile strength link combined with new stud, cup-washer, and T-screw gives added durability. New link construction provides maximum flexibility for cooler, wear-resistant running.

Get the complete story of this great new v-belt for D and E drives. Send coupon now for new 8-page illustrated catalog.

VEELOS
THE LINK
V-BELT

Veelos is known as Veelink outside the United States.

MANHEIM MANUFACTURING & BELTING CO.
613 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.

Name .....

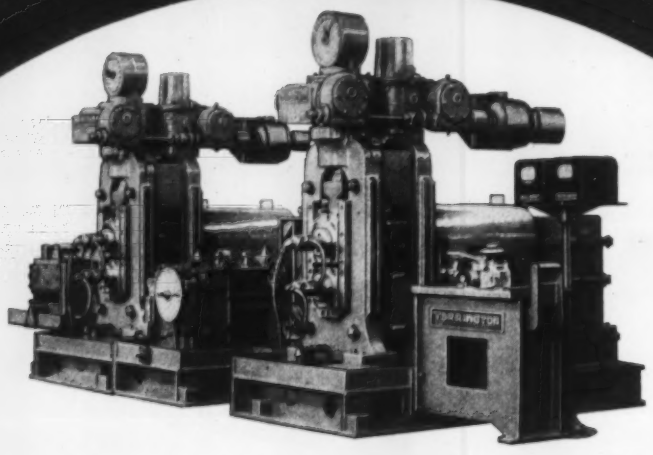
Company .....

Address .....

.....

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

YOU CAN LOWER WIRE ROLLING COSTS



...with a Torrington Flat Wire Mill

SPEEDED PRODUCTION — Torrington Flat Wire Mills achieve finishing speeds up to 3500 FPM.

GREATER ACCURACY — Processed wire can be held to tolerances of .00025″ in thickness and .0005″ in width. Automatic magnetic gauges eliminate waste.

FLEXIBILITY — Combination of two or three flattening stands, with edgers, can accommodate wide variety of work.

DEPENDABILITY — Torrington machines are ruggedly built for years of repair-free service. Easy access to flattening rolls and other major components greatly reduces downtime for maintenance, adjustment and threading.

COMPLETE ENGINEERING SERVICE — Auxiliary mill machinery should be selected only after thorough consultation with experienced engineers. Torrington's engineering staff, backed by the knowledge and skill gained while serving the metal mills for nearly 70 years, will work with you to provide machinery best fitted to your needs. For full information, call or write: Mill Machinery Division, Torrington Manufacturing Company, Torrington, Conn.

THE
TORRINGTON
MANUFACTURING COMPANY
TORRINGTON · CONNECTICUT

STEEL

August 16, 1954

Technical Outlook

BIG DITCH— Need a ditch 15 feet wide and 30 feet deep? Gar Wood Industries, Wayne, Mich., has the digger machine on the drawing boards now. When built, it will be the biggest machine of its kind: 81 feet long, 15 feet high, 12 feet wide and tipping the scales at 65 tons. Price is expected to be about half what conventional equipment would cost to do the job.

ROBOT INSPECTORS— Electronic inspection at Ford's Northville, Mich., plant hits a new high in automaticity. Not only does it check 3000 precision ground exhaust valves per hour to plus or minus 0.001, but divides the "overs" from the "unders" and stamps them red or green so engine assemblers can select the exact size. As if that weren't enough, a memory device decides if a flaw can be corrected by additional machining, then sends the rest to scrap. Final touch: The robot inspector hollers for more parts when the supply in the feed chute gets low.

CERAMIC NUCLEAR SHIELDS— Up to now, the only thing wrong with ceramic coatings for use in high-temperature protection of alloys in nuclear reactors, was the high thermal neutron absorption coefficient. Boron, with its large neutron capture cross section, has been eliminated from the frit material, and some satisfactory coatings have now been developed in National Bureau of Standards research labs.

SARDAP— You'll probably be adding this word to your technical vocabulary. Specifically standing for "small angle radiation detection and presentation," it represents a new group of radiation devices designed for industry. All have three things in common: A device containing a radioactive source, a high efficiency counter, and an electronic recording system. One instrument under development will detect holes in metal 0.000001 cu in. in volume. It is designed for control functions, such as measuring minute variations in thickness of sheet steel and detecting and grading flaws in welds.

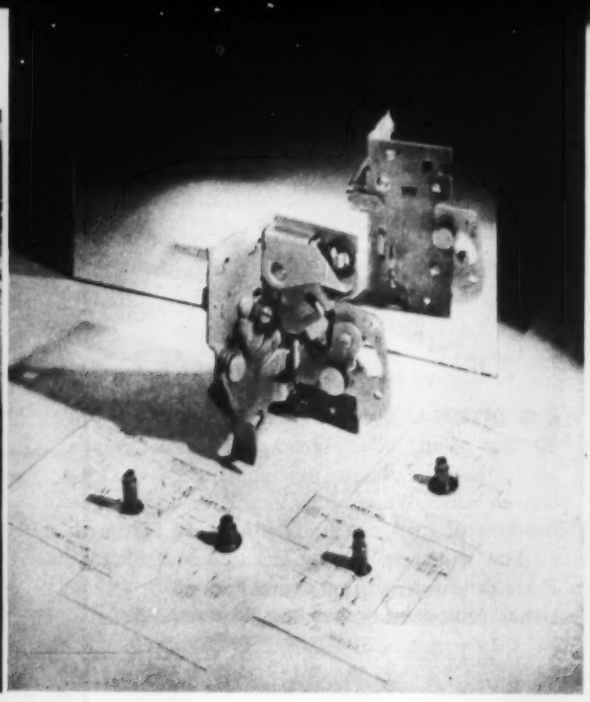
BETTER SMOKING— How'd you like a little rubber in your tobacco? The idea didn't appeal to a leading tobacco company either, but that's what they found when small particles chipped off their new rubber conveyor belt and became mixed with the product. They took their problem to B. F. Goodrich. Goodrich engineers took the cue from a magnetic device the company already had installed to remove metallic particles from the tobacco. They metallized the belt by adding ferrous oxide to the rubber. Now particles from the belt are picked up by the magnetic separator, along with other metallic bits.

ARGON SUBSTITUTE— Shielding gases in most inert gas metal arc welding processes have been either helium or argon, or a mixture of the two. Some of the other gas mixes appeared less suitable. Now, experience at the Kansas City plant of Buick-Olds-Pontiac assembly division indicates that a helium-nitrogen mix may add new benefits in welding low-carbon steel, while retaining all the benefits of the welding process. The gas is cheaper and allows 50 per cent reduction in amperage when used in place of argon mixes.

REFRACTORY CASTABLE FOR 3000° F— Addition to the refractory market is a castable capable of actual use to 3000° F. The manufacturer's lab tests indicate a melting point of 3200° F for the product which shows high erosion, abrasion, slagging and spalling resistance and no permanent shrinkage either on first firing or after repeated cycles.

Metalworking Outlook—p. 45 *Market Outlook—p. 139*

Fastening analysis conducted by Tinnerman in Cleveland covers products ranging in size up to complete new model autos. Here, the right side and door are under study



Here's the result of another approach to an automotive assembly—four specials designed for this door lock. They're cold headed by Townsend Co., New Brighton, Pa.

FASTENERS

Design for Specials

Many large fastener users are finding it's profitable to eliminate components and assembly steps with multi-function specials. It's a shot in the arm for producers too

DESIGNING for specials is becoming standard for many large fastener users. Engineered for multi-purpose assembly functions, they are a welcome source of production economy.

They're also a welcome source of income for a good many fastener manufacturers. The industry, cramped by a $200-million drop in business over the past two years, is selling at a rate of about $450 million annually. This year, something like 20 per cent of that total will go for specials.

Special How?—According to W. H. Hill, Scovill Mfg. Co., a true special represents an individual problem that calls for custom engineering and segregated planning, costing and merchandising. Other definitions vary a little, but the conclusion is the same: A customer with an assembly problem gets a fastener engineered to put his particular product together more economically, usually by integrating several functions in one component.

The result may be achieved by several methods. Of course, refinement of cold heading brought standard bolt, screw and rivet manufacturers into the business of actively pushing special projects. But ready adaptability of some of the proprietary fasteners to special designs also plays an important part.

Question of Dimensions—Some specials must be machined; most can be, but not profitably. By its nature, a special fastener takes on some fairly extreme dimensions which usually will make time required and waste resulting from a machining operation prohibitive.

For example, Scovill cites as its experience these general types of threaded fasteners most clearly included as specials and adaptable to cold heading: 1. Those involving multiple diameters and varying cross-sections; 2. those involving extreme diameters and thin head sections; 3. those requiring unusually large displacement of metal in the head.

Why Special?—Almost any assembly can be put together with standard components and techniques. The special fastener field is predicated on the theory that

Checklist for Special Design

If you think you see opportunity for a multi-purpose part, a way to cut assembly time, here's a summary of the things a fastener manufacturer will have to know before he can come up with a design and a bid:

1. Part description and part number.
2. Dimensions and allowable tolerances for each dimension. Don't make your tolerances unnecessarily severe; the more generous the tolerances, the more likely a saving.
3. What is the part's use; what does it have to do? This factor is most essential to simplification.
4. Include a drawing—not necessarily a blueprint if one isn't available, but a comprehensive detailed sketch.
5. A sample, if the part has been made before. With this, engineers can spot possible variations from specs.
6. If no sample is available, how was it made previously?
7. Material description—especially if kind and quality are critical. If heat-treatment is necessary, specify extent.
8. Specify finish required. If part must be plated, what type of plating and what is minimum depth?
10. Quantities on which to quote, covering minimum and maximum.
11. Approximate number to be used each year.
12. When shipment must be made.

Becomes Standard

By WILLIAM R. WOLFE
Assistant Editor

many can be assembled with considerable savings by taking another look and engineering at least some of the fasteners to the particular job. The result may be elimination of parts; it may be elimination of processes; it may be increased assembly speed.

An example is the simple register flap made by a Cleveland heating equipment manufacturer. To regulate warm air flow, the company employs an ordinary metal flap installed on two wire hinge pins so the opening can be controlled manually. To do the job, they purchased the wire, cut the pins to length and inserted them in the rolled portion of the flap. After flap was closed, the pins were welded in place.

Present simplification of this multiple operation is a heavily-barbed pin supplied by Townsend Co. Pins are inserted in the rolled section of the flap, which then is closed. Barbs make an impression in the flap that keeps pins from turning. Result: No more wire inventory and cutting operations; no more welding or maintenance of welding equipment.

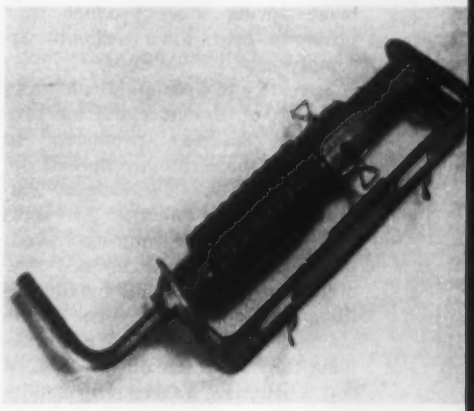
Greater Speed — Small assemblies are most susceptible to profitable use of specials. Of particular significance can be the striking increases in assembly speed effected on some smaller components by custom fastener planning.

Milford Rivet & Machine Co. cites the fluorescent lighting fixture manufacturer who used a double-assembly part consisting of a tapped and grooved steel component produced on a screw machine, and a slotted round-head machine screw. The two were positioned by hand. The single cold-formed part that replaced the two pieces is fastened in place in a conventional high-speed hopper-fed rivet-setting machine. The latter automatically stakes the shoulder of the part against the inside of the fixture housing.

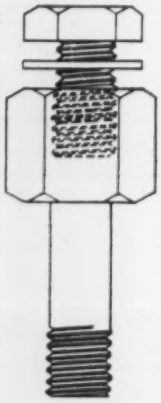
The company saves about 2 cents on cost of the part. Of considerably more importance is placing and fastening the part, where speed of operation is up something like 400 per cent. It means a saving of $10,000 a year on this small part alone.

Promotion by Analysis — Emphasis on specials is characterized by combined roles of educator and consultant assumed by some of the fastener manufacturers. Townsend has conducted a series of what it calls seminars to illustrate the versatility of cold heading. The New Brighton, Pa., producer does it by bringing several representatives of a potential customer to its plant and letting them see first hand what has been done. The effect has been to drum up considerable business in specials where a customer can visualize possibilities for assembly advantages as applied to his own products.

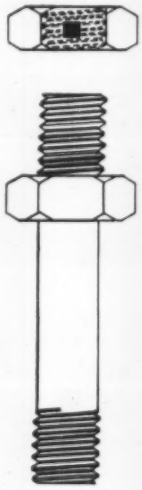
Tinnerman Products Co. uses a different approach. The company devotes an entire department of



One spring steel part holds this TV tuning coil in place, fastens the coil into the chassis. Another result is that it greatly simplifies adjustment of the coil in the set



Drawing exemplifies the special proposition. Servel used the components at left to mount the compressor for its room air conditioner—a part made of hexagon bar stock on a screw machine with cut threads, drilled and tapped into assembly with a washer and bolt. Townsend redesigned the part, cold headed it in one piece. Further simplification could be a Nylock Type E lock nut. Annual savings to Servel amounted to about $14,500



its Cleveland plant to analysis of products ranging in size up to complete automobiles. Appliances are a rich commodity. Out of each analysis comes a comprehensive report covering the entire fastener system.

The service is free and there's no obligation, but obviously altruism is not the entire motive; the company is in business to sell fasteners. And they usually do, since the company's engineers usually come up with adaptations of their basic spring steel product that prove to beat down ultimate assembly cost.

Specialty to Special—Basic units of some of the specialty or proprietary fastener producers in many instances fit into special design requisites. The case of Tinnerman is outstanding. The company's patented spring steel product itself cannot be classed special. They're produced by the billions and sold to anyone in the market. But the individual problems they've taken on have called for countless variations of the basic unit, plus many spring steel fastener applications that do not even incorporate the Speed Nut.

Of the many tuning coil fasteners developed for various TV assemblies, one of the best is an ingenious device adopted by Westinghouse Television-Radio Division—a one-piece spring tension clip designed by Tinnerman to serve a double function. It provides assemblers with a coil form fastener that permits more rapid attachment of tuning coils, at the same time achieving simplified tuning adjustment.

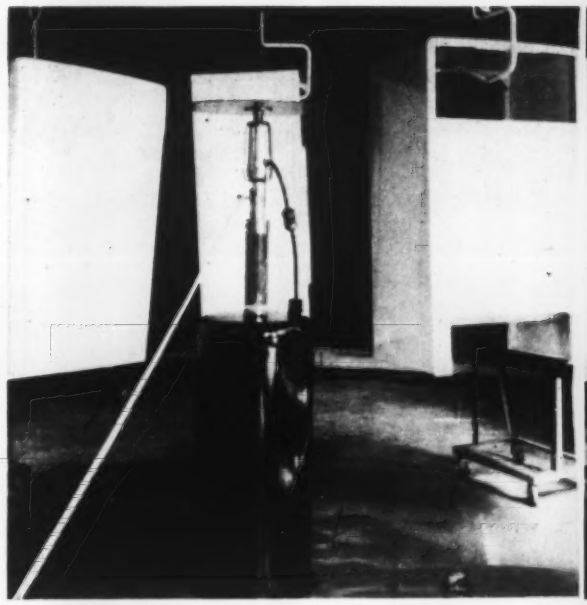
A circular emboss in each end secures the coil form. At the adjustment end, the emboss is notched and provides two spring tension fingers which bear against the adjusting rod. After positioning, tuning coil simply is pressed into the fastener where it is secured by spring tension. The subassembly coil form is mounted to the chassis easily when spring fingers engage matching holes to lock the unit permanently in place. Fast coil adjustment is achieved by pushing or pulling the rod, a relatively simple proposition since the unit used previously had to be adjusted with a socket-head screw driver.

Special Economics — Promotion of specials is essentially a hard-sell device, particularly with the large scale bolt, screw and rivet manufacturers. With more than 250 producers competing for business, the industry operates on a fairly narrow profit margin and the special market can be perilous.

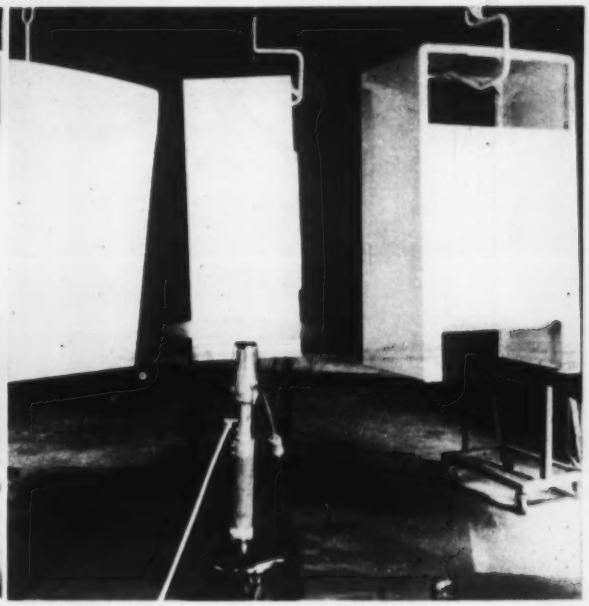
Almost none of these so-called gimmicks, the special components or fasteners, is patented. Thus, a producer after expending considerable time, engineering talent and sales effort to come up with the right part, can fail to get the order. Or, he can be sold out after the initial shipment by the customer's purchasing department, which may pass out samples to competitors in the hope of getting a slightly better price.

Problem of Tooling—Bid or contract price is the essential element of the producer's life in the special market. In many cases, he must amortize his costs and realize his profit out of the initial order.

If you're contemplating a one-shot short-run proposition, it probably will engender little enthusiasm on the part of prospective suppliers. One of the largest producers of specials pursues a policy whereby it must visualize an initial order of at least 100,000 pieces before it will even bid on a part. Anything less, they say, results in merely selling tooling and setup time.



Reciprocating disc atomizer near top of stroke



Cylinder nears bottom of the stroke

RECIPROCATING ATOMIZER . . .

Increased Paint Uniformity

Effect of up and down motion on uniformity extends not only to small parts. Up to 2 mils are applied to refrigerator doors in one loop through paint area

RECIPROCATING disc type atomizer, a development used with the Ransburg No. 2 electrostatic spray-painting process, is an adaptation that should be instrumental in increasing painting uniformity. Although Ransburg has several stationary, disc-type atomizers already operating in finishing departments, the reciprocating adaptation is a new feature of the No. 2 process.

With up and down motion, its effect on uniformity extends not only to small parts, but to larger components such as refrigerator cabinets and doors.

Positioning—Parts are hung on a conveyor which makes a circular loop in the spray area. The atomizer is located in a pit in the floor or mounted overhead in the loop's center.

The pant is pumped to the disc center, which rotates to feed the paint to the atomizing edge.

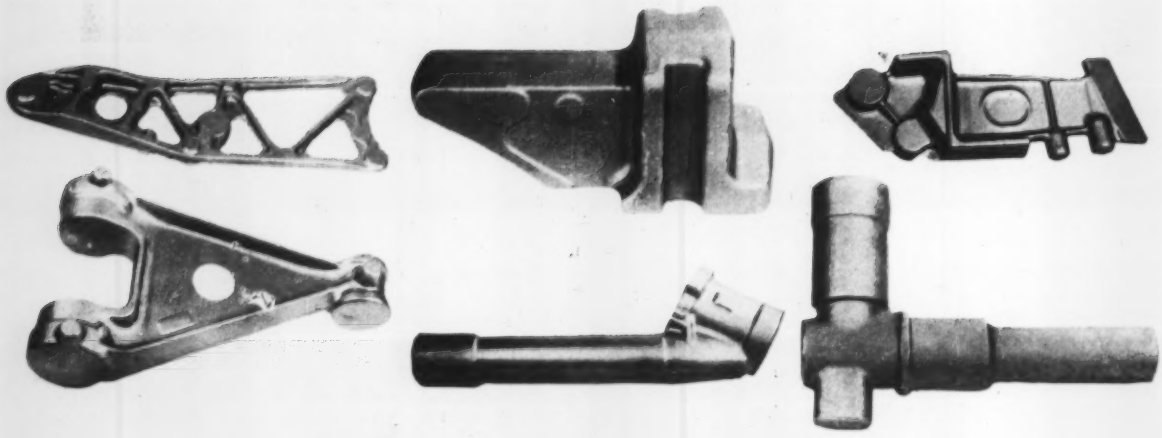
Reciprocating unit does not require precise positioning of parts in relation to the atomizer. The unit will tolerate a 10 to 24-inch difference with practically no spray pattern problem. The company reports a single 25-inch disc is capable of atomizing five times as much paint as one atomizing bell of its triple-head unit.

One Pass — Reciprocating disc permits application of heavy, uniform coating with one pass in the spray area. With refrigerator whites, up to 2 mils are applied with one loop in the spray area. Objects to be painted may get twenty-five 60-inch strokes—comparable to a number of passes in the painting area.

Different reciprocating speeds may be controlled automatically within the stroke. For example, in coating metal chairs where less paint is required to coat the legs, movement can be stepped up automatically.

Within broad limits, various part sizes may be painted indiscriminately. For instance, refrigerator sizes from 55 to 66 inches high and 24 to 30½ inches wide can be painted with excellent uniformity. In addition, where parts of various vertical dimensions are handled, it's easy to change length of stroke on the move, without stopping or slowing production.

Two Lines at GE—First big appliance manufacturer to put the equipment to work is General Electric Co. GE soon will have eight reciprocating discs painting refrigerators in prime and finish on two lines at Appliance Park in Louisville, Ky.



Aircraft industry is thinking of forging these structural parts, now steel, in titanium. Object is to save on weight

FORGING TITANIUM—

A Prescription for Production Headaches

Critical check points are design, die sinking and raw materials. Material, though sluggish, evidences normal flow characteristics. Tendency is to extrude through thin sections

By JAMES J. RUSS
Chief Metallurgist
Steel Improvement & Forge Co.
Cleveland

MANY GRADES of titanium and its alloys are commercially forgeable. Their chemistries make it possible for them to be readily hot worked without undue critical attention or high scrap loss—both factors that affect normal forging costs.

The bulk of our production at Steel Improvement and Forge Co. is with the alloys—Ti-150A, Ti-140A (Titanium Metals Corp.) and RC-130B (Rem-Cru Titanium Inc.).

In forging, at least three factors must be fully considered before fabrication is started: Design, die sinking and raw materials—about in that order of importance.

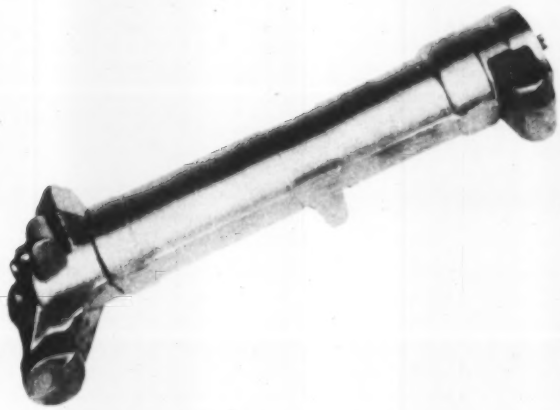
Die Design — A great deal of thought should be given to the peculiar flow characteristics of the material, which must be incorporated into design. Titanium and its alloys, while sluggish, exhibit normal flow characteristics, although there is a distinct tendency to extrude through thin sections rather than follow the die contour. This makes it difficult to fill rim sections or bosses, when using conventional design. Additional dies of more extended design or possibly intermediate dies may be required for a forging converted from steel to titanium.

Attention must be given to the selection of a die block of proper size and hardness. Generally, titanium requires about 30 per cent more delivered impact to get the same flow pattern as steel. This greatly influences die life, which is reduced by an accelerated washout condition.

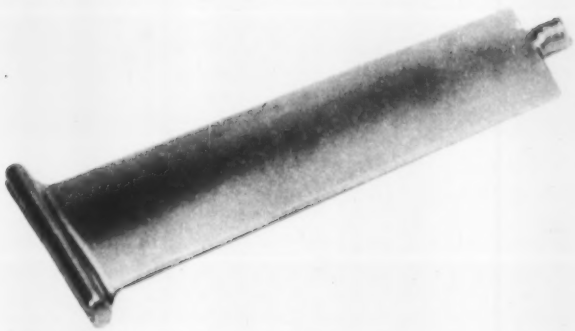
Die Sinking—The same general precautions used for forging dies for aluminum must be exercised in the sinking of dies for titanium. It is highly essential to finish final benching by buffing, to remove all marks from machine work, such as milling, planing and boring. Any rough surface will tend to restrict metal flow.

Generally, to sink steel dies it is the practice to allow for cooling shrinkage of 0.187 or 3/16 inch to the foot. For titanium this shrinkage amounts to only 0.116 inch per foot. This also must be taken into account when designing dies for larger sections; dies for forging steel cannot be used unless dimensional discrepancies resulting from shrinkage differentials are within design limits.

Cleanliness — Raw bar stock must be clean. This means the



This titanium landing gear cylinder forging for jets weighs 91 pounds. Made with alloy steel, it weighs 163 pounds



When this compressor blade is made from titanium, it weighs but 0.31 pound; identical stainless steel part 0.5 pound

absence of open tears, laps or seams, plus freedom from heavy continuous guide marks or scratches.

We have made it a practice to order rough turned or centerless ground stock. Another reason for getting the material in this condition (rather than letting the mill hot roll and condition it) is that titanium is susceptible to cracking, due to localized heating during grinding. Here the human element is critical. Minute cracks tend to open up or propagate during grinding or subsequent forging operations.

High quality surfaces on bar stock can't be stressed too strongly. In upsetting, for example, longitudinal defects, such as seams or heavy guide scratches, will act as stress risers, even at forging temperatures. They will be initiating points for open ruptures. Scrapped forgings have been traced to seam depths as slight as 0.0015 inch, where the forging upset ratio (based on cross-section) is less than 2 to 1.

Here is the procedure we use to remove oxide from the surface of titanium forgings (to be distinguished from our "no scale" process): 1. Shot blast. 2. Immerse in 60 per cent caustic for 10 minutes. 3. Rinse. 4. Immerse in 8 per cent nitric—2 per cent hydrofluoric solution for 15 minutes and 5. Rinse and scrub. (Time specified can vary with the nature and severity of the oxide layer.)

Temperatures — Heating poses no special difficulty. It can be done in an open, gas-fired furnace of conventional design or an electric furnace with a gas curtain. We find a slightly oxidizing atmosphere gives best results. Temperatures generally range from 1650 to 1800°F, although we limit our working range from 1600 to 1650°F, depending upon the severity of the forging operation.

Metal suppliers generally advocate: If temperatures are 1800°F or higher, soaking time should be held to a minimum.

It should be stressed that cleanliness of the hearth and surrounding area is important when forging titanium. The material is but slightly exothermic, but when reacting with steel or chips, scrap forging can result from localized reactions.

Oil-fired furnaces are not recommended for heating. Titanium has a high affinity for carbon and other contaminants frequently associated with the grades of oil generally used in forge furnaces.

Processing — The hammer or press is operated in a conventional manner. Select a suitable hammer or press to promote uniform flow—the unit having about a 30 per cent higher rating for titanium than steel on the same job.

The material has a wide working range (1800 to 1400°F), but prolonged heating above 1700°F limits the amount of effective flow below 1500°F.

There has been considerable discussion on the effect of reheating and forging on grain size and ductility of alloys. Some believe critical reduction affects grain growth on subsequent reheating and forging. We have found that prolonged soaking above 1750°F has an adverse effect on ductility at room temperature.

We employ no special post heating or slow cooling cycles after forging. The heat treatment given forgings prior to shipment is usually specified by the customer.

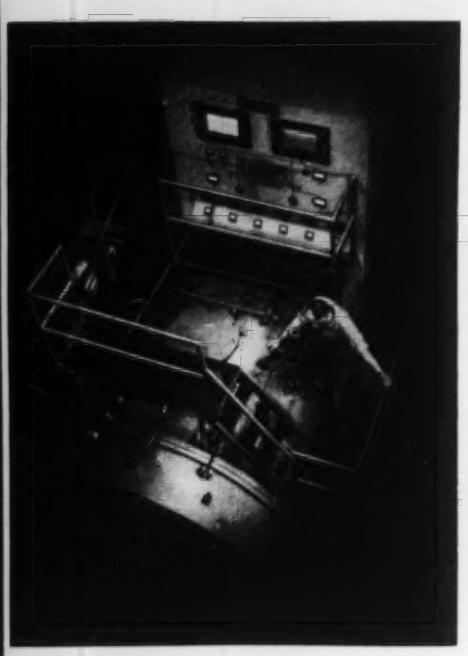
Problems — Commercial forgers find straightening can be a problem in the fabrication of thin forgings, such as compressor blades, particularly where sections are thin. Shock straightening, such as by hand or press, frequently results in breakage. To overcome this, if trim pads cannot be used, heating in the range of 400 to 600°F greatly facilitates straightening and avoids breakage.

The same practice is followed if excessive conditioning is necessary between operations, but, generally, grinding can be done at room temperature, providing forgings are given an immediate stress-relief anneal at 1300°F.

Machining is one of the more difficult phases of titanium production, because of the hard-layer, skin effect, but we at Steel Improvement and Forge Co. have developed a "no-scale" process to substantially eliminate this hard oxide coating.

Vacuum Metallurgy Grows . . . . . .

Extra Tough Alloys Melted And Cast In Vacuum



METALLURGISTS are convinced that the best atmosphere for some operations is no atmosphere at all. High vacuum furnaces now offer a practical way of making alloys with properties not obtained by conventional processing.

A 1000-pound-capacity furnace —largest ever built for melting and centrifugally casting high-temperature alloys—is being installed at Utica Drop Forge & Tool Co., Utica, N. Y. Production will be concentrated on Waspalloy, Pratt & Whitney Aircraft's candidate for one of today's toughest jet engine alloys.

Tougher Metals — Utica's new furnace, (see cut) designed and built by F. J. Stokes Machine Co., Philadelphia, (and a second one of the same size which Stokes is also building) will carry out all the heating, melting, alloying and casting operations within the vacuum chamber. Rated at 1000 pounds, chances are good it will handle close to 2000 pounds when the setup gets going.

Tests by Utica and Pratt & Whitney metallurgists show that vacuum melting increases the stress rupture life of turbine blades 2½ times over conventional arc melted metal.

The improved properties of vacuum purity metals will let jet engines operate at higher turbine temperatures for longer time. This means more thrust along with higher speeds.

Service life of turbine parts goes up, replacement cost for parts is less and the period between overhauls lengthened.

Vacuum melting and casting saves critical and expensive alloying elements, such as titanium and molybdenum, that may be oxidized and lost during atmospheric processing.

Another factor is that hardening qualities of alloying metals are fully effective in smaller quantities. The alloy is improved by elimination of dissolved gases and inclusion. Scrap can be remelted for re-use as a high alloy.

Newcomer Picks New Vacuum Alloys Backed by Research

WE ARE getting into the vacuum melted alloy field, headed by a new alloy that will stand higher temperatures than other wrought alloys now in production, says Carboloy Department, General Electric Co., Detroit.

The new alloy, developed by the GE research laboratory in Schenectady, will be turned out in Carboloy's new vacuum facilities. Its stress rupture properties are said to be better than wrought turbine bucket alloys such as M252 and S-816.

Shooting for '55—Initial output will be from a pilot-plant 400-pound vacuum furnace that can turn out 100,000 pounds of high temperature alloys annually. New furnaces ranging in capacity from 100 to 1000 pounds will be in operation by March 1, 1955.

Vanadium-Alloys Steel Co., Latrobe, Pa., will convert the 400-pound vacuum alloy ingots into bars, strip, sheet and other commercial shapes.

Wrought alloys produced by conventional methods can stand temperatures of only about 1500° F, according to GE jet experts. Vacuum techniques increase high-temperature strength and improve ductility. Metal yield also goes up with vacuum, that is, weight of finished product to weight of cast ingot.

More to Come—Carboloy expects that within a short time alloys of nickel or cobalt-chromium base, hardened with molybdenum, tungsten, carbon, titanium and aluminum, will be produced to stand temperatures of over 1600° F.

This advertisement first appeared about a year and a half ago. It is repeated because the customer has since reported that gasket performance in this rugged service proved extremely successful since adopting gaskets made from Revere Deoxidized Copper Tube.
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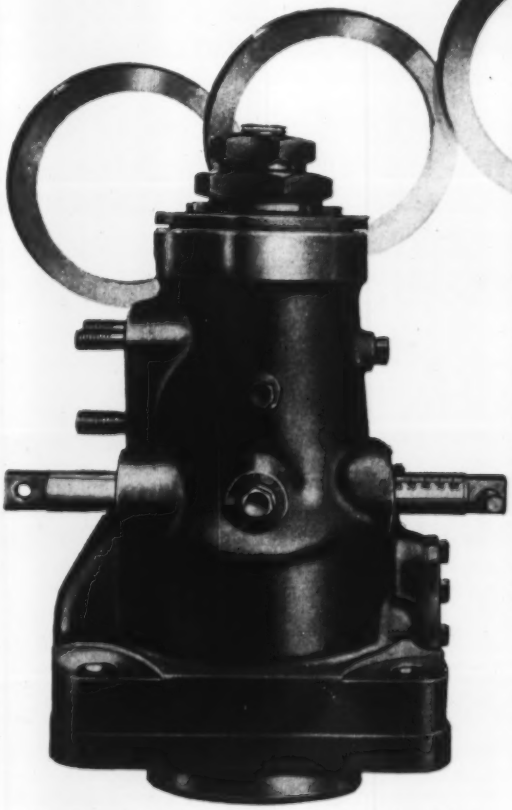
Gaskets

USE REVERE DEOXIDIZED

Tube!



Diesel Fuel Injection Pump, made by American Bosch Corp., Springfield, Mass., and gaskets made by cutting rings off 2" deoxidized copper tube.

● An important extra service rendered by Revere consists of collaboration in setting up specifications. This is valuable because there are many different Revere Metals, each with special characteristics. No one copper, for example, will serve to best advantage in every application. A case in point is the matter of copper gaskets for Diesel fuel injection pumps. Copper is of course an ideal metal for gaskets, and is widely used for that purpose. But for this special application, which copper and in what form? The pump is used on large engines for municipal generating plants. It weighs 186 pounds, and must produce the high pressure required to inject fuel near the top of the Diesel compression stroke. Naturally, the load is a pulsating one. American Bosch Corporation came to Revere with the problem. Our suggestion was that much scrap could be saved if the gaskets were made by cutting rings off copper tube, instead of stamping them from strip. This achieved a double purpose, since the tube is made of deoxidized copper, which is superior in this application to electrolytic. We are able to report that these recommendations proved successful.... This work was done by the Revere Technical Advisory Service. To get in touch with it, see the nearest Revere Sales Office.

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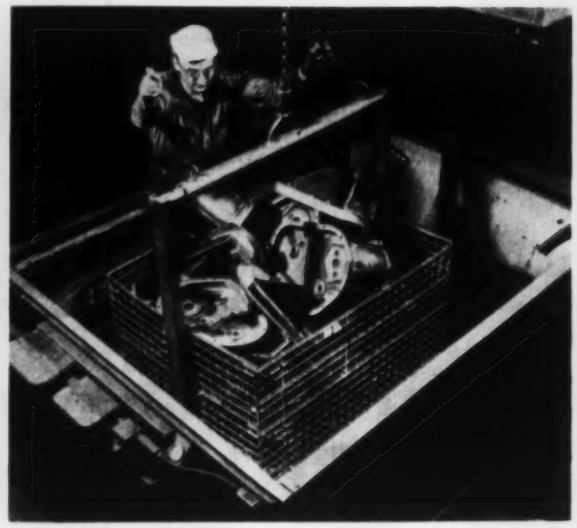
Cut down area required for adequate parts storage



Reduce handling problems in processing

Keep Small Parts on the Job

Improvement and greater use of metal containers for small parts has been a significant handling development. Here's an outfit that plays the system for all it's worth

ONE OF THE best-accepted and most profitable of recent material handling developments has been refinement and expanded use of various metal small-part containers. Easily handled, stored, and built to keep assembly moving smoothly, they provide a rugged improvement over some previous methods.

A good example is the Cargotainer made by Pittsburgh Steel Products Co. At Gehl Bros. Mfg. Co., West Bend, Wis., these stackable, collapsible, lightweight steel wire boxes serve a 150,000-sq-ft plant. Evidence of acceptance of the boxes by the crop harvester manufacturer is the fact that 2100 are in use—about five for every employee.

Overcoming Limitations — Gehl began using Cargotainers to replace wooden tote boxes in 1950. The tote boxes were 24 x 36 x 16 inches, cost about $2 apiece to make.

Important in the boxes' limitations was the fact that they could be stacked only to a height of about 5 feet. In addition, parts within the boxes could not be piled above the top of the box and contents were not easily inventoried. With good care the wooden boxes had a useful life of one year.

The welded wire mesh Cargotainers are 36 x 46 x 24 inches, with a 4000-pound capacity. They cost about $42 apiece. But, cubic volume is nearly three times that of the totes. Because of reinforced construction, fully loaded containers can be stacked up to five high (about 12 feet) using storage space in many sections of the plant to within a foot of the ceiling.

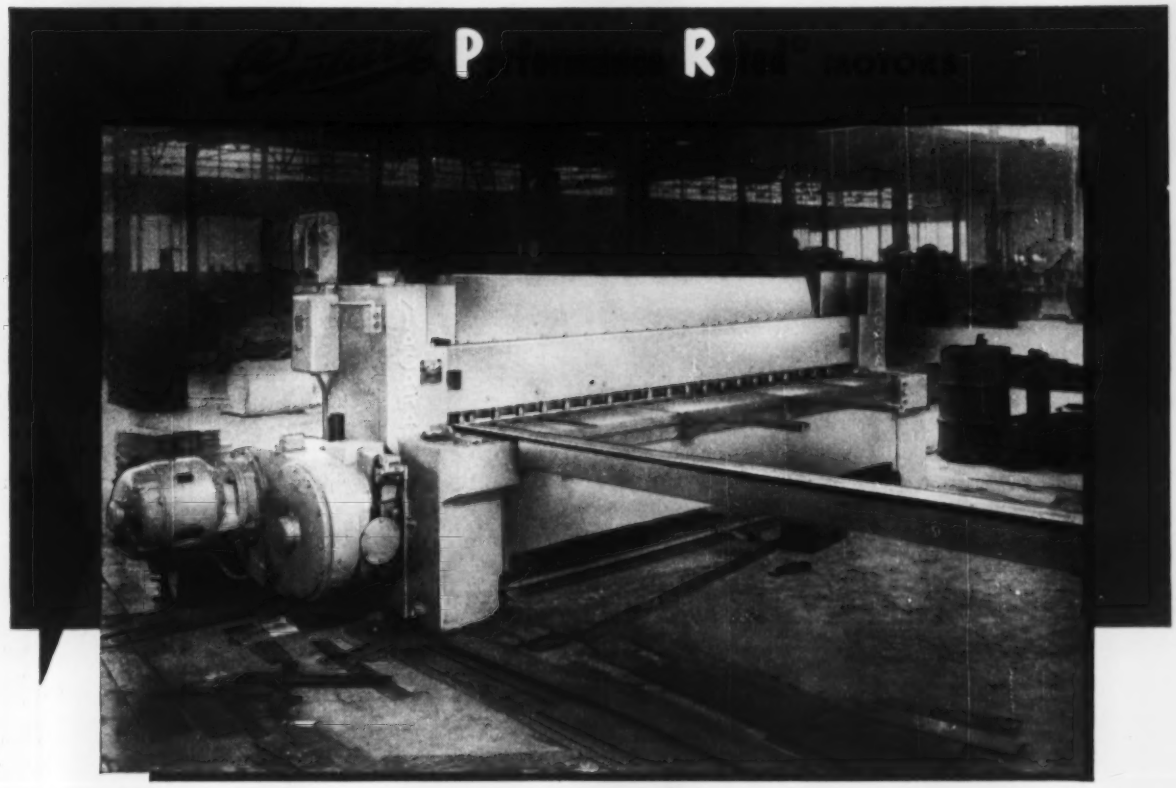
Savings in Storage — Clearance provided by 7-inch fabricated steel legs enables storage of parts above the top level of the wire mesh and provides easier handling by lift trucks. Visual inventory afforded speeds selection of parts for production and processing units. And there's no more threat of toppling tote boxes.

Biggest saving to Gehl is in plant storage area. Through higher tiering, Cargotainers have saved the equivalent of 25,000 sq ft of floor space. Of course, this is supplemented by smoother parts' feeding throughout assembly operations.

Less Handling—There are other advantages. Formerly, forged and cast parts from suppliers arrived at Gehl's plant, shipped loose in trucks.

Then they had to be unloaded manually into tote boxes and weighed. This required the work of three men for 2½ hours. Using Cargotainers, the truck delivering parts is unloaded and weighed by two men in 15 minutes, saving Gehl more than $1000 a month in handling costs alone.

Formerly, transmissions were loaded manually into a fabricated steel rack and immersed in cleansing solution for degreasing. Now the degreasing pit has been rebuilt for Cargotainers, and an operation that once required 16 hours takes only six.



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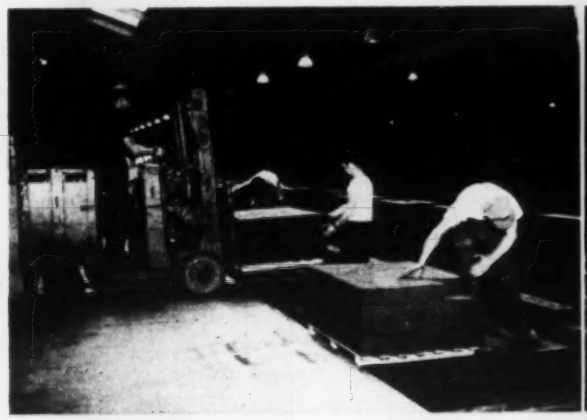
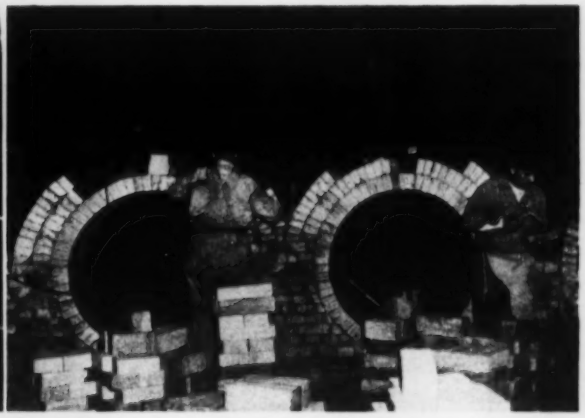


Basic brick, despite its higher first cost, is more than holding its own. All-basic open hearths are gaining with lighting of a second one on this side of the Atlantic



Availability of good brick layers in steel mills is becoming more critical. Thus the continuing of the trend towards more castable and rammable refractories wherever possible

Mill Users Favor Quality Refractories

Suprisingly few mills have returned to less costly refractory materials during the lower operating period. They're willing to spend more, now that they've learned it pays

By ROBERT M. LOVE
Pittsburgh Editor

THE "INDUSTRY behind all industry" is meeting new demands of steelmaking with accelerated research. Changing industrial conditions require continuous progress in refractories.

More costly refractories are replacing those of lower cost to an appreciable extent, refractory producers report. To the user the higher cost is more than compensated for by longer life of the refractories, decreased maintenance costs and less downtime for repairs.

Critical Service—As an illustration, conventional silica brick has been replaced by super-duty silica in critical areas of some open-hearth steel furnaces. The super-duty silica brick contains not more than 0.50 per cent alumina, titania and alkalies.

Because of its higher purity, the super-duty brick has higher refractoriness and greater resistance to corrosion by slags than silica brick of conventional quality. In many cases, super-duty silica brick is used to form entire roofs; in others it is used together with conventional brick to attain balanced roof life in open-hearth furnaces.

More Basic Brick — In open-hearth steel furnaces there has been a trend toward use of basic brick instead of silica brick in the port ends. Basic brick includes chrome, magnesite and combinations of chrome and magnesite. Some are fired, others chemically bonded. Generally they are encased in thin sheet steel casings. At furnace temperatures the metal at hot ends of the casings oxidizes and combines with the magnesia of the brick to form a joint-free surface. The metal in the cooler portions of the casings remains rigid and adds strength to the construction.

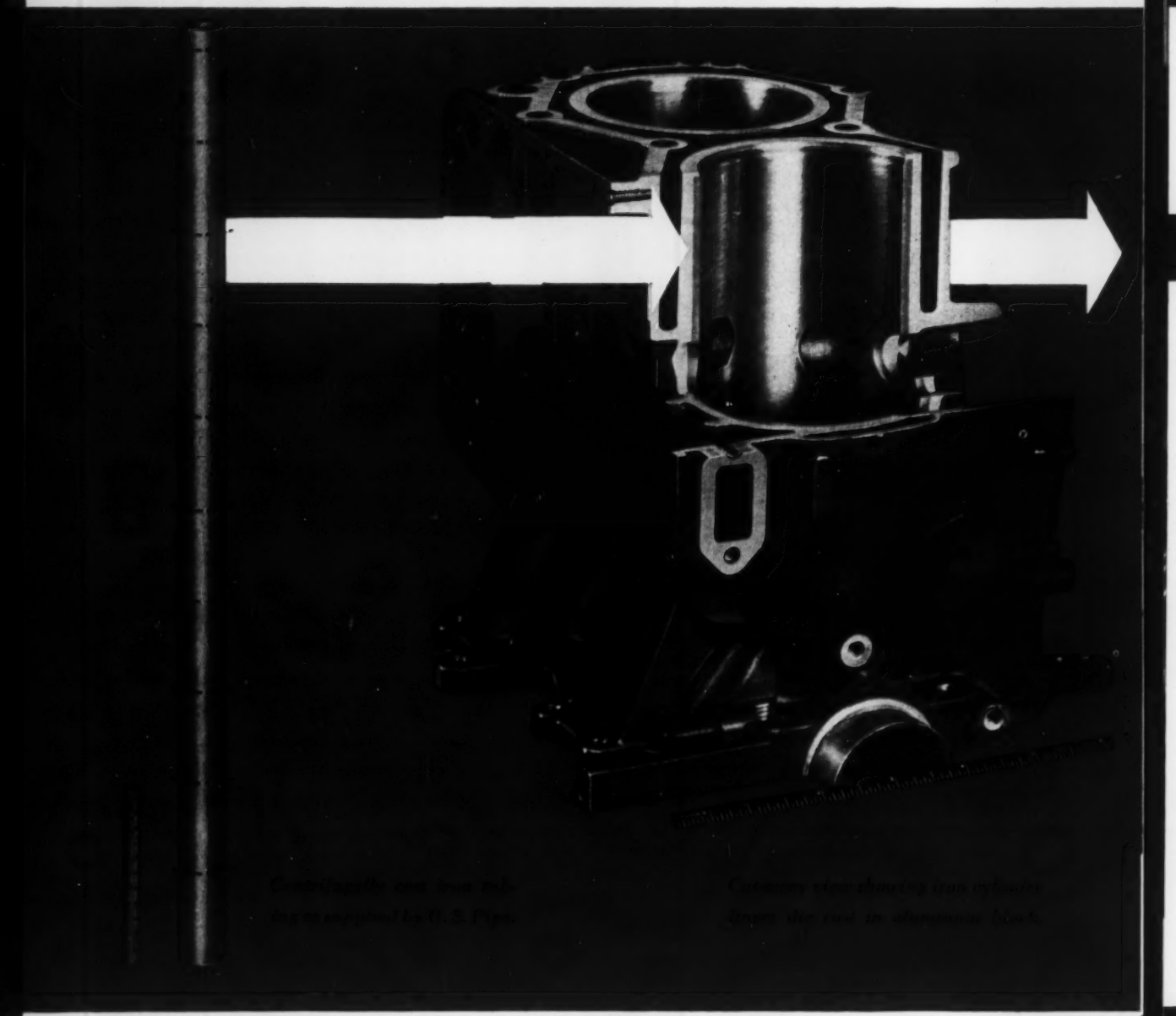
Basic brick has a high melting point and high resistance to corrosion by basic slags. When basic brick is used instead of silica in the ends of open hearth furnaces there is no silica drip into the slag pockets. As a result the solid material which drops out from the dust-laden outgoing gases is not fluxed by silica and, therefore, forms a more-or-less granular deposit which may be removed readily from the slag pockets.

Importance of Selection — Growing awareness of need for careful selection of refractories is leading to less haphazard use of the general-purpose refractory, high-duty fireclay brick, believes J. S. McDowell, technical assistant to the president of Harbison-Walker Refractories Co., Pittsburgh. This material is no longer used as indiscriminately as in the past. To an increasing extent it is used only when it is the right brick for the job.

Result of this careful selection is that materials last longer on the average. High-duty fireclay refractories have been replaced to some extent by super-duty fireclay brick and by insulating brick.

Despite curtailment of steel pro-

IT TAKES QUALITY IN EVERY PART TO BUILD THE STAMINA



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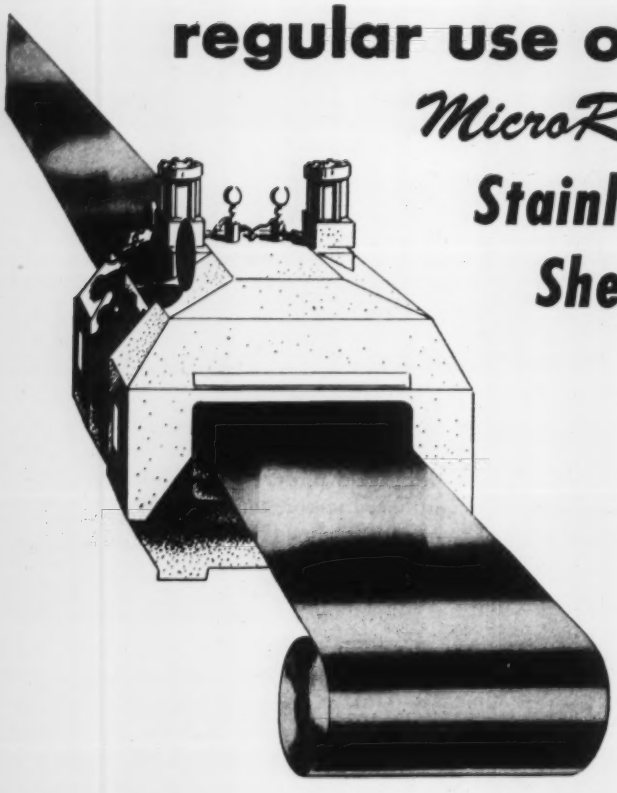

SAVES MONEY!

Stainless sheets are usually ordered by gauge number—with permissible A.I.S.I. thickness variation of plus or minus 10%—but are sold on a weight basis. Thus, you may order 18 gauge, needing about .0475″ thickness, and receive .052″ thickness. But Micro Rold may be held to a 3% plus or minus tolerance; and you may order by gauge number, specifying that it be rolled on the "light side" of the gauge range. While these savings may not be apparent in every single sheet of MicroRold, the weights will average less than the theoretical when figured over a period of time. These savings can be substantial in your annual profit picture.

Washington Steel Corporation
WASHINGTON, PENNSYLVANIA

duction, General Refractories Co. reports that instead of a decrease in the amount of basic brick used, there appears to be little change in consumption. If anything, they say, there has been a slight increase. The higher first cost has apparently justified itself in the minds of the user.

Trend Toward Castables — Another trend in the refractories industry reported by producers is an increase in sale of plastic fire brick and castables. Plastic fire brick is a hot-setting fireclay refractory of proper plastic consistency for ramming into place without further preparation. It can be installed by a plant maintenance crew without special experience.

Applications of plastic fire brick include monolithic furnace linings for such constructions as boiler and oil still settings, oil burner installations, heating furnaces, forge furnaces, annealing ovens, cupolas and furnace door linings. Plastic fire brick is especially adaptable for making quick emergency repairs, as it can be rammed into place to fit any desired form or contour.

Installation Simplified — Refractory castables consist of ground refractory materials with an admixture of a hydraulic setting agent. They are installed in much the same manner as ordinary concrete, and may be tamped, poured or gunned into place to form baffles, arches, walls, door linings, high temperature pipe linings, furnace hearths and other refractory constructions.

The refractory industry as well as the steel industry is continually working with higher temperatures. It is actively engaged in research which may lead to the development of refractories with even greater resistance to high temperatures and other severe furnace-operating conditions.

What will atomic work mean for refractory producers? Atomic development is progressing so rapidly that no one knows what may happen next. Probably atomic power plants will use some refractories of the conventional types for conditions which are not above capacity of present refractories. They will also require some highly-specialized super-refractories which are still in process of development.

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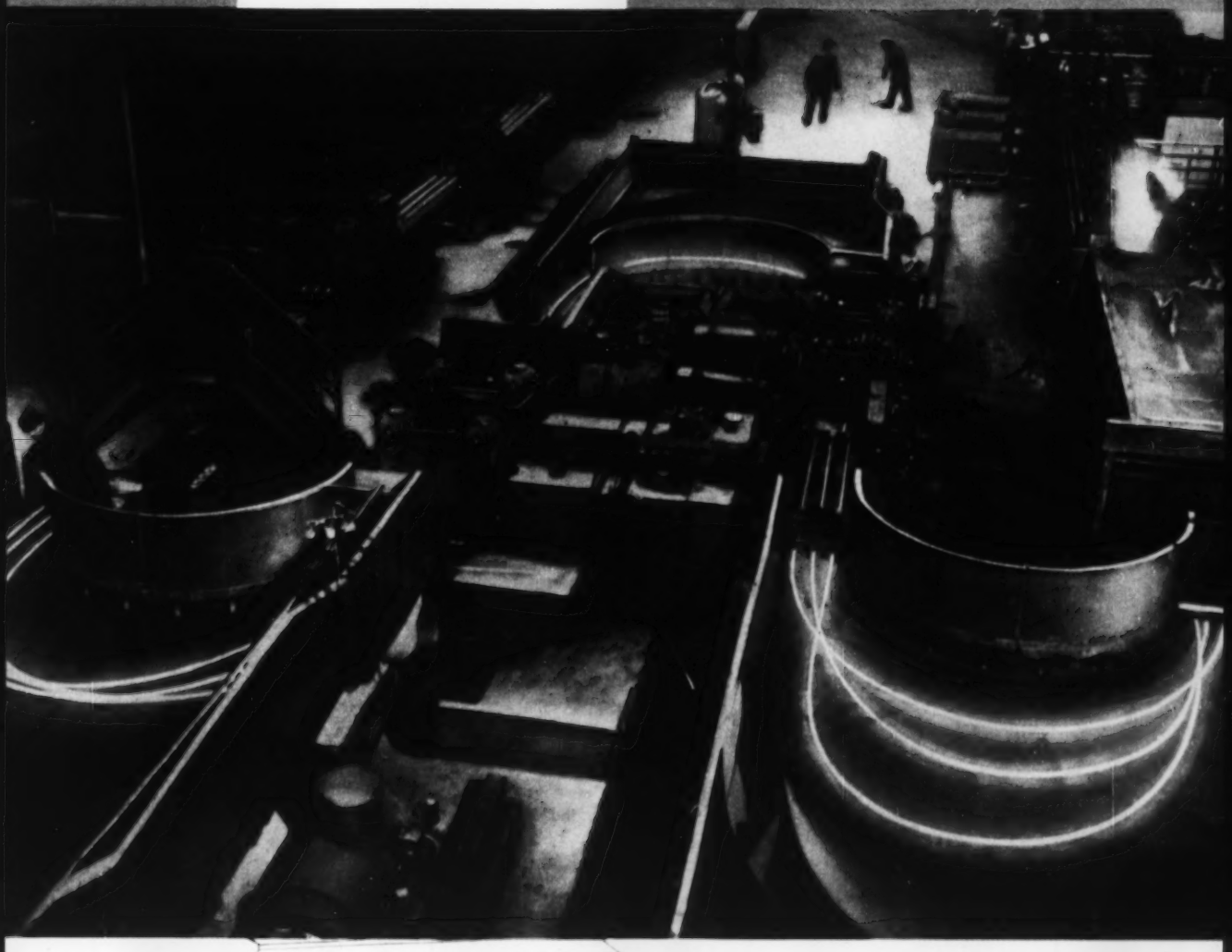

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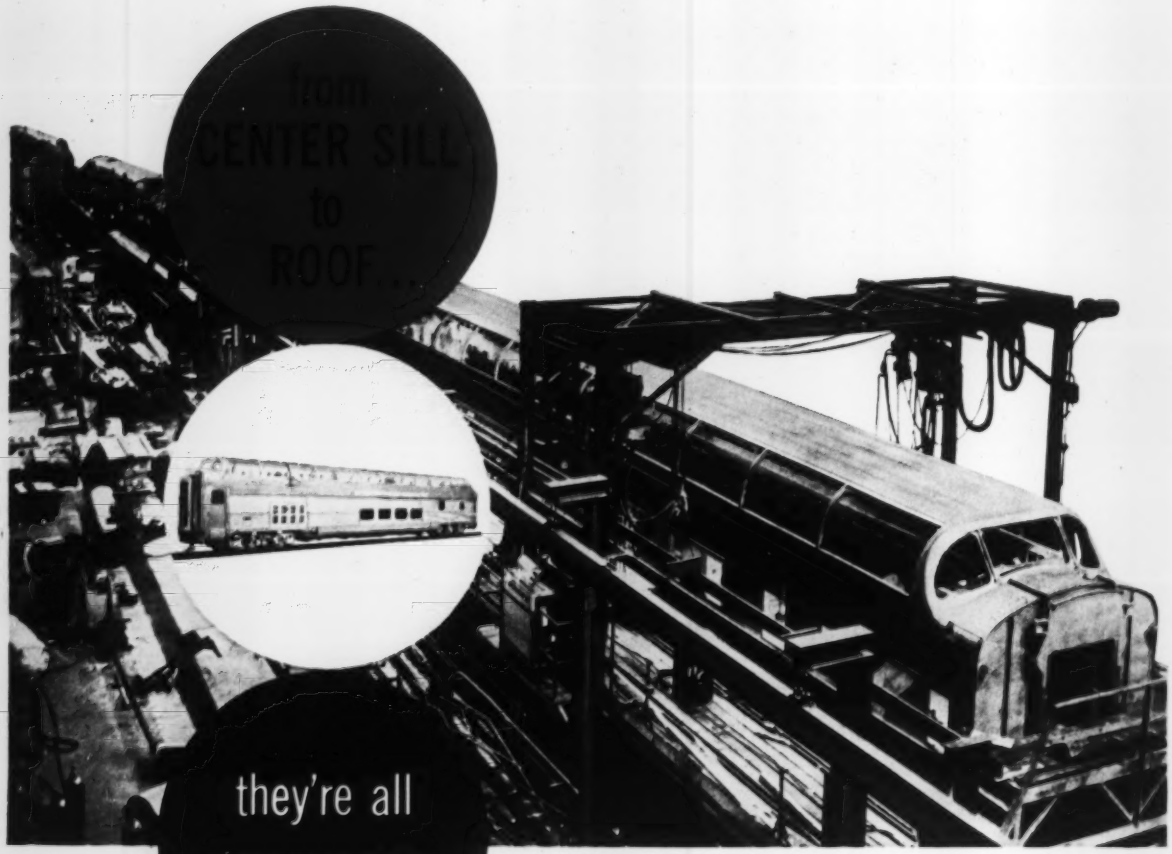

These full-length dome cars are part of an order for 121 being built by The Budd Company for the Santa Fe Railway. They feature not only unexcelled facilities for passenger enjoyment . . . but also the *safety and economy* of Crucible Rezistal® stainless steel.

Because they're *all stainless* — their strength-weight ratio is higher than you'd find in low alloy carbon steel. The cars are *lighter yet stronger* than ordinary steel cars, which means the Santa Fe will be able to haul as many as 25 of these cars with the same drawbar pull they'd need for 20 low alloy carbon steel cars.

What's more, the passive surface of Crucible stainless will never need painting . . . never need more than a "once-over-lightly" by maintenance crews to keep its sparkling new look. And, beneath the skin, where corrosion and vibration can undermine the strength of vital structural members — the high corrosion resistance and fatigue strength of Crucible stainless will keep these cars in service for a lifetime.

Budd would not have chosen stainless for all the cars they build unless it was a *practical shop metal.* And it is. For it can be formed, machined, welded, drawn, heat-treated — processed in any way you'd normally use for ordinary steel.

So don't forget the Crucible family of stainless steels where you need corrosion resistance . . . high fatigue, creep and structural strength . . . resistance to wear and temperature extremes . . . workability. We'll be glad to help you select the best stainless grade for your job. Let our Metallurgical Engineering Department make practical suggestions.

CRUCIBLE first name in special purpose steels

54 years of *Fine* steelmaking **STAINLESS STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • MAX-EL • ALLOY • SPECIAL PURPOSE STEELS

Canadian Distributor — Railway & Power Engineering Corp., Ltd.

Reaming (shown above) is the final step in the first operation setup of 14 machining cuts for the manufacture of collet blanks from SAE 4150 material

Chucker Joins Automation Line

TURRET LATHE work is brought into the scheme of automation with a chucker that features automatic control of the entire machining cycle.

National Acme Co., Cleveland, says its new, 12-inch, universal, single-spindle chucking automatic has proved up to 5 times faster on floor-to-floor time than former methods for this class of work.

Its open tooling zone and easily accessible chucking area afford plenty of room for automatic loading equipment, if the machine is to be adapted to an automation line.

Gist — Cycle time is predetermined for all machining operations in a setup. After loading, there is no time loss from the start of the machining sequence until finished piece is unloaded.

The company points out that operator fatigue is reduced, you can get the same machine cycle rate at the end as at the start of a shift, and production can be scheduled accurately.

Versatile—Wide speed and feed ranges (speed changes are automatically controlled during the machine cycle) give this Acme-Gridley chucker versatility. Carbide and high-speed tooling, plus threading, can be combined in the same setup. Each of the five turret toolslides and two cross slides is independently cammed.

Idle-time movements, such as advancing toolslides to cutting position, returning them after completion of cut to turret indexing position and indexing of turret slides, are all accelerated.

Tooling—Machine is said to be easy to tool up. The tooling zone is without interference from shafts or accessories—operator has free access to tools at elbow height. Cams for the toolslides are readily accessible, and the timing control switches are grouped for operation from cam dogs mounted on a single drum at the rear of the machine. This design for quick change-over makes the air-operated chucker practical for small lot setups and long production runs.

Adaptability for additional tooling, including specialized attachments for self-opening threading dies and collapsible taps, increases operations to be included in a single automatic setup. Rehandling of the piece is avoided.

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ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
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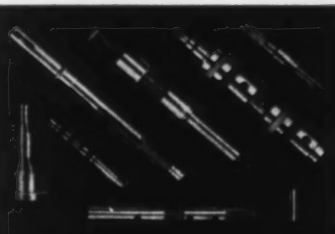

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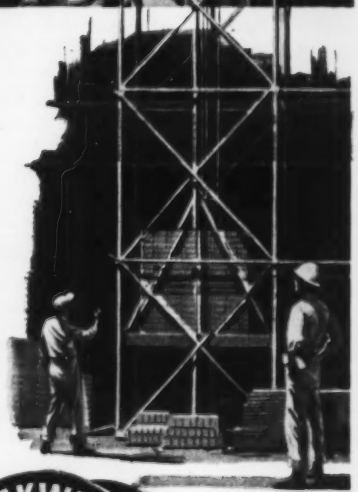
took the load off his back

Sweat and a strong back just aren't enough when it comes to meeting the stepped-up demands of modern construction work. Today's contractors and builders call on *muscles of steel*—sturdy wire rope—to lift and carry their heavy loads.

Supplying these *muscles of steel* to the giant that is American industry is our big job here at Wickwire—a job that has commanded our vigilant care and painstaking quality control for over half a century.

In the mines and the quarries. In the logging camps and the oil fields. On construction and highway projects. With the fishing fleets and in materials handling. Wherever wire rope is used, Wickwire Rope has earned an outstanding reputation for efficiency, utmost safety, long economical service and unfailing reliability.



every industry benefits from wire rope

WICKWIRE ROPE

CFI PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

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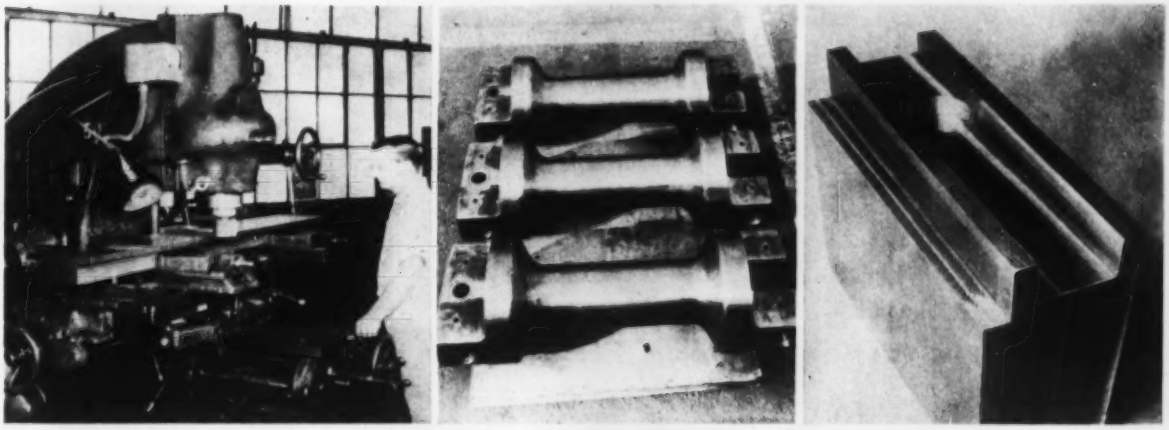


Helical carbide milling cutter cuts into a rack (at left) about three times the speed formerly used. In milling tongues on mill drive shafts (center) 105 pounds of 4140 steel were removed in 49 minutes. Former time was 145 minutes. Tests on the 4140 block, (at right) showed second end-milling cut cleared chips without recutting

Helical Carbide Cutters Step Up Milling

Chip riddance is one of the handsome features as helical carbide cutters cut through metal up to three times as fast as standard tools. Vibration is also down

CUTTING SPEEDS have been tripled under proper machine conditions, with helical carbide milling cutters on machines at the Torrance, Calif., plant of National Supply Co.

Most impressive to machinists and others who have watched its operation, however, is one of the related factors. Freedom with which chips are expelled by these cutters from the cut brings the first expression of surprise. Chips don't cling to the cutting teeth to be revolved back into the cut. Elimination of this single factor means a drastic reduction of tool breakdowns.

No Shake — Surprisingly little vibration is the third major factor to show up. Machine vibration was less than for the slabbing cuts on hardened 4140 steel using other types of carbide cutters.

Cutters used in tests and production work are helical end mills, 3 inches in diameter with six blades, 3 inches long. Helix angle is 15 degrees. Shanks are 2 inches in diameter. Cutters are made by Sonnet Tool and Mfg. Co. (division of Sonnet Supply Co.) under the name Helicarb.

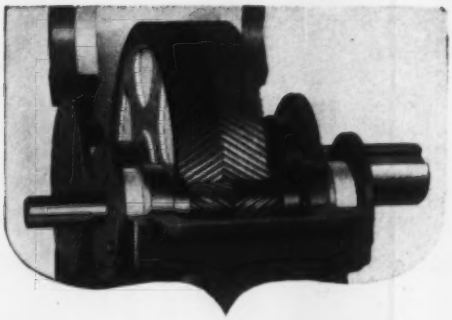
Sample Job — On drive shafts for steel mills—4140 steel forgings quenched and drawn to 270 Brinell —the turned, 10-inch diameter ends were rough milled to produce tongues 3½ inches thick by 4¾ inches long. Job was done on a Kearney & Trecker Milwaukee 15-hp vertical milling machine.

Average rate of stock removal was 2.1 pounds a minute for a total of 105 pounds removed. Spindle speed was 400 rpm with a cutting speed of 314 sfm and feed of 10.5 ipm. Chip load was 0.0044 inch per blade. Time was cut from 145 to 49 minutes.

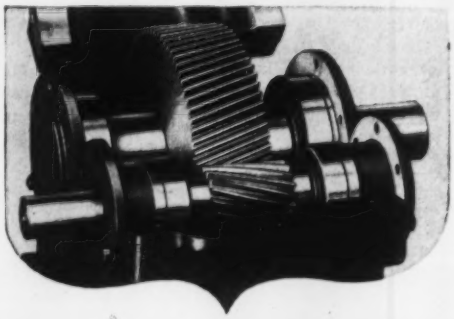
Future—Greatest field of application for these cutters appears to be for steels, particularly those that are heat-treated to tensile strengths of more than 200,000 psi. Finishes of 30 microinches rms and better have been reported on high alloy steels with tensile strength approximating 200,000 psi.

As much as 180 cubic inches a minute of 75ST aluminum have been removed on a 10-hp Kearney and Trecker mill, it is reported. In tests on nonferrous materials, removal of 6 to 8 cubic inches a minute per horsepower has been recorded.

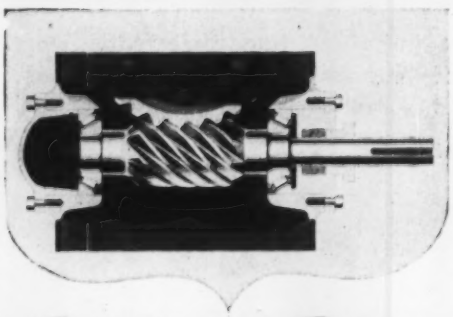
Helix angle for these materials and soft steels is 50 to 100 per cent greater than for hardened steels. The rake angle for steels is zero. Clearance angles and lands vary with the properties of the materials to be cut.



A Complete Line of Speed Reducers



HERRINGBONE • HELICAL • WORM GEAR



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• Horsburgh & Scott Speed Reducers are available in 3 general groups, 12 distinct types in many sizes and hundreds of standard ratios. Many considerations, such as speed of driving and driven shafts, shape of housing and characteristics of drive, point definitely to one specific unit as the best drive for a particular duty. Having such a complete line to select from, engineers have exceptional freedom for unbiased selection of the right reducer for the job.

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GEARS AND SPEED REDUCERS
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Send note on Company Letterhead for Speed Reducer Catalog 46

Three-Station Machine

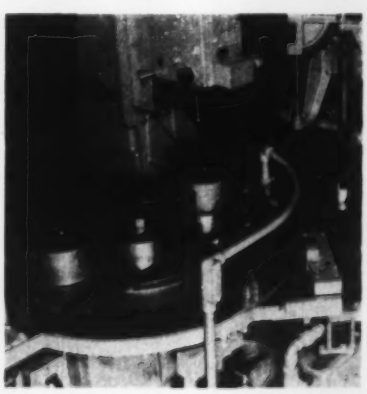
AUTOMATED three-station machine that includes a drill unit, broaching machine and stamping unit has been developed by Colonial Broach Co., Detroit. All operations are performed on a common base in one continuous cycle.

All three operations are grouped around what is known as the heart of the machine—the loading and indexing mechanisms. A typical machining cycle on an automotive camshaft sprocket includes, in the following order: Drilling one 0.2656-inch-diameter hole in the sprocket web; broaching an 0.1885 to 0.1905-inch keyway in the shaft hole; and stamping the time mark on the sprocket.

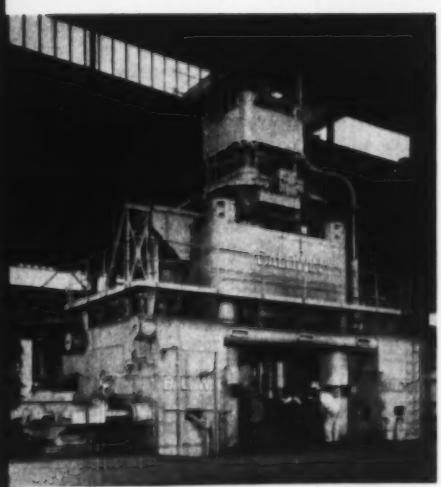
Proper Relationship — Included in the loading and indexing fixtures are locating guides that maintain all three operations in proper relationship to one another. Broaching is done by a Colonial pull-down machine. Hydraulically-actuated unloader deposits completed parts onto a conveyor.

Indexing table is located off-center and below the loading table. Parts are loaded—sprockets in this instance—six at a time into circular holders on ends of oscillating loader arm.

Completion Rate—In the application cited, the machine performs the three operations, plus loading and unloading, on about 200 parts per hour. One 10-hp motor powers loading, indexing, broaching, stamping and unloading.



PARTS LOADED MANUALLY
. . . table indexes every 45 degrees



These propeller blanks were forged on Cameron's 26,000 ton multiple ram split-die ferrous metal forging press.

ANOTHER LARGE SIZE AND INTRICATE SHAPE IS FORGED

Pictured above are 64" aircraft propeller blanks now being forged from steel, rough machined and cold pressed at Cameron Iron Works, Houston. These forgings, free of inclusions and crevices, are then drawn and shaped by the prime contractor into propeller blades.

You too may have the need for forgings which will result in improved quality products at lower manufacturing costs.

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IRON WORKS, INC.
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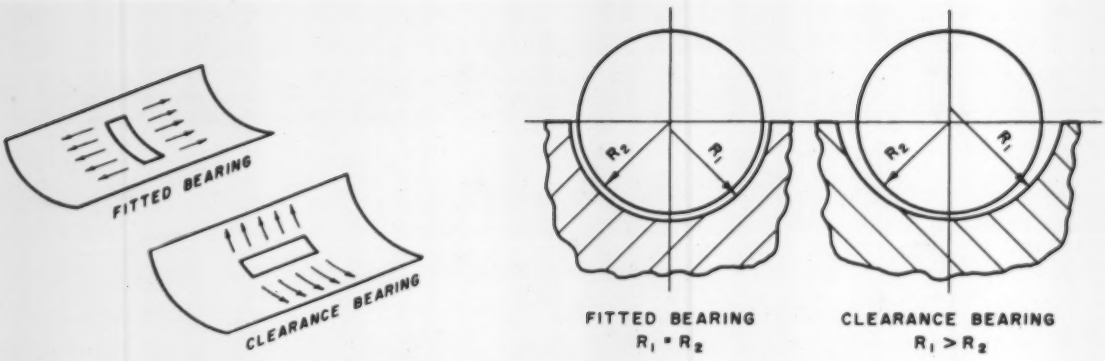

Choice is between fitted and clearance bearings. With former, maximum oil leakage tends to be along shaft axis as indicated. The maximum leakage on the latter bearing will be up and through the side clearance

Hydrostatic Lubrication

A Way To Break the Law of Friction

Secret is that bearings always have a supply of lubricant. This includes such conditions as starting and stopping, slow speeds, reciprocating motion and excessive loads

By T. L. COREY
Research Engineer, Lubricants Division
and
E. M. KIPP
Chief, Lubricants Division
Aluminum Research Laboratories
Aluminum Company of America
New Kensington, Pa.

A MOTOR you'd normally find in an electric clock drives the million-pound telescope at the Mt. Palomar observatory!

The 1/12-hp motor is standard, and you won't find anything too unusual in the design of the telescope's bearings, although they have an unbelievably low coefficient of friction (0.000004).

Lubrication is the secret. Or, to be more specific, hydrostatic lubrication instead of the conventional hydrodynamic type.

Which Means — Bearings always have an adequate supply of lubricant. This includes conditions under which it is difficult or impractical to develop and maintain conventional systems, such as starting and stopping, slow speeds, reciprocating motion and excessive unit loads.

Conventional lubrication systems require the relative motion of bearing surfaces for the formation and maintenance of desired lubricating films. Hydrostatic systems do not. They provide a continuous supply of fluid under pressure. Journals are floated on a continuous, moving film.

Frictional values hit a new low. Greater latitude is afforded in the selection of lubricating fluids and bearing materials.

Not Blue Sky — The practical value of hydrostatic lubrication has been confirmed in a number of applications by Alcoa. Both liquids and gases have been used, but most theoretical and practical work has been with incompressible fluids, such as petroleum and synthetic oils.

Of course, the manner in which the lubricating fluid is introduced between bearing surfaces is critical.

It is not merely a question of piping oil under pressure into the bearing elements.

Major design considerations include: 1. Geometry of bearing surfaces. 2. Dimensions, shape and orientation of the high pressure pad. 3. Dimensions of the bearing. 4. Optimum lubricant film thickness and 5. The effect of bearing temperatures and pressures upon the viscosity of the lubricating fluid.

Geometry—Choice lies between a fitted bearing and a clearance bearing. Generally, a fitted bearing will require less volume of oil flow and lower operating pressures for a given oil viscosity and load.

High unit loads and low oil viscosities will demand greater oil

What the Authors Say . . .

"THE USEFUL application of hydrostatic lubrication is limited only by the ingenuity and creativeness of the design engineer, but it is not a panacea for all bearing lubrication problems . . . its potentialities should be kept firmly in mind in the design, construction and operation of bearing elements.

"It is possible to calculate with confidence the design requirements for virtually any type of mechanism involving sliding motion for practically any geometry, size, load and speed, when using an incompressible fluid as the lubricant. When the basic simplicity and ease of application of the principle of hydrostatic lubrication becomes more widely recognized and understood, it is believed that increasing use will be made of these concepts."

Here Are Two Successful Applications

A clearance bearing designed to operate hydrodynamically at normal speeds: Slower operating speeds were required, and it was found that the lubrication system was inadequate. Bearing supports a maximum vertical load of 1 million pounds. Desired lubrication was attained with hydrostatic pads to which oil was supplied at 0.3 gpm and a pressure of 12,300 psi. Area of the hydrostatic pad was 2.8 per cent of the normal projected bearing area. Pad was oriented parallel to the axis of the bearing. Total projected bearing area was 1000 inches.

Stepped thrust bearing designed for a maximum load of 3 million pounds: Friction had to be held to a minimum at slow speeds. Oil was fed to high pressure pads at ¼ gpm at a pressure of 3400 psi. Total projected bearing area was 1922 sq in, with 1.6 per cent (31 sq in) formed in the high pressure pad area. Viscosity of the oil was 250 SSU/100° F.

volumes at higher pressures than may be available from a commercial pump. A clearance bearing will accentuate these difficulties while a fitted bearing will minimize them.

Dimensions, etc.—The size and shape of the high pressure pad will be determined by the total bearing area and the load to be lifted. The pad is usually rectangular.

Although there are no cut-and-dried rules, it is generally satisfactory to select a high pressure pad area of about 2½ to 5 per cent of the normal projected area of the bearing. This is one of the variables that can be adjusted to some degree in developing a final design.

The load-carrying capacity of a hydrostatically lubricated fitted bearing is that of the oil pressure acting on the high pressure pad area, added to one half of the oil pressure acting on the remaining surface of the bearing.

For a fitted bearing, the pressure at which oil is to be delivered to the high pressure pad is independent of the film thickness. With a clearance bearing, lift capacity of the hydrostatic pad area is dependent upon such variables as film thickness, size and orientation of the high pressure pad with respect to the bearing axis.

On a fitted bearing with a high pressure pad, the tendency for maximum oil leakage will be along the shaft axis. The length of the rectangular slot should be placed normal to the shaft axis. A clearance bearing should have its high pressure pad placed with the length parallel to the shaft axis. The tendency for maximum oil leakage will be up and through the side clearance. If the length of the pad is placed normal to the direction of maximum oil leakage, greater lifts with less oil flow and more even oil distribution will result.

Size—Bearing size usually places the second limitation on the size of the high pressure area. Remaining bearing surface unit pressure must be carefully checked. Permissible unit pressures for the bearing material should not be exceeded.

Film Thickness — This variable has the greatest influence on required oil pressure and flow for clearance bearings. Extremely low film thicknesses offer the greatest stability and the least volume of flow, but they require greater precision in machining mating surfaces of bearings and provide a smaller margin of safety against metal-to-metal contact. Precision here is less critical when operating film thickness is increased at the expense of greater flow requirements and decreased oil film stability. Film thicknesses of 0.0005 inch can be used without endangering bearing life.

Viscosity — The success or failure of a bearing will depend entirely upon the viscosity of the oil supplied to it. The temperature and pressure at which the bearing is to operate will determine the actual viscosity of the fluid, and it is this operating viscosity that must be considered.

As an approximation, the temperature rise of an oil within a bearing will be approximately 14°F for every 1000-psi increment. At 5000 psi, the viscosity caused by pressure will be approximately double that at atmospheric pressure.

Applications—Compression testing machine platens that are hydraulically supported and spherically seated were an early application.

A typical application is a babbitt-lined, fitted bronze bearing of the partial journal bearing type. Maximum bearing load is 100,000 pounds. Oil with a viscosity of 65 SSU/100°F is used.

Specifications called for the virtual elimination of starting and operating friction. Requirements were met by supplying the hydrostatic pad with oil at 3500 psi and at a rate of ½ gpm. Area of the high pressure pad was 15.6 per cent of the total projected bearing area. Pad was oriented normal to the direction of the bearing axis. Total projected bearing area was 38.5 inches.

This flick of the wrist saves dollars per year!

Even in the elementary job of watering industrial truck batteries, EDISON batteries have been designed to save you money. As part of its steel construction, each cell is equipped with a hinged filler cap which opens easily and cannot be mislaid. Minutes per day are saved by this EDISON feature alone.

This is only one reason for EDISON battery's lowest over-all cost. Because of their resistance to electrical abuse and their steel cell construction, EDISON batteries give more than *twice the performance life* of other type batteries in industrial-truck operation. They are not harmed by the overcharging, or short-circuiting incidental to this service. Ease of daily handling and charging of EDISON batteries also keep industrial truck costs down to minimum.

Examine the EDISON cell's profitable advantages at your own desk. Send for bulletins 2039 and 3808; ask for the EDISON field engineer's call. Write Edison Storage Battery Division, Thomas A. Edison, Inc., West Orange, New Jersey.

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EDISON ALSO MAKES THE FAMOUS "V.P." VOICEWRITER AND THE TELEVOICE SYSTEM

Wheel Positioning

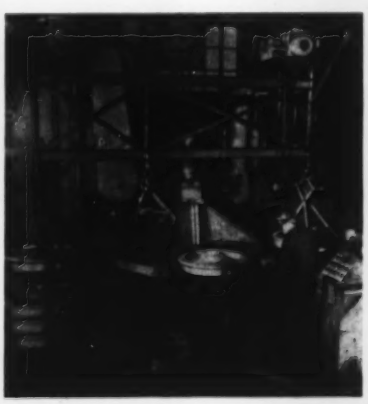
MACHINING of railroad wheel surfaces is a pushbutton operation with equipment recently installed at the McKees Rocks Wheel & Axle Division, U. S. Steel Corp.'s Homestead District Works.

Standard 33-inch MCB wheels are completed at the rate of about 27 an hour, under control of one man. Equipment lifts and positions a wheel, bores it, faces it and delivers it to a pile on the floor ready for removal. One wheel is bored and another faced while a completed wheel is being removed and another picked up from the floor for boring and facing.

Tong Movement — Equipment combines a Snyder vertical index boring and facing machine with a specially - designed, motor - driven lifting device utilizing three pairs of Heppenstall automatic tongs.

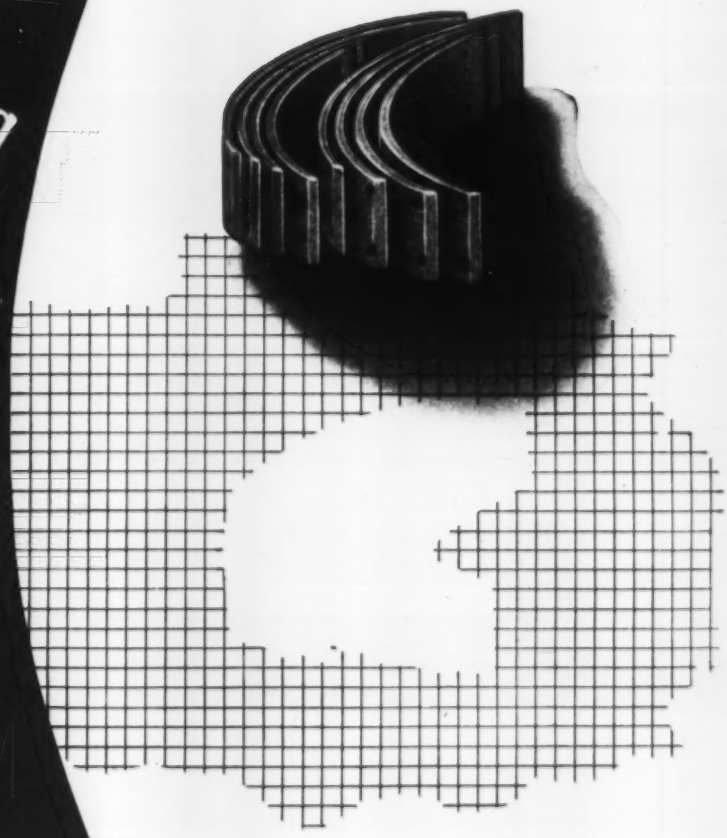
In operation, wheel blanks are picked up by a pair of lowered tongs while a second pair is lowered to pick up a completed wheel. At the push of a button, tongs are moved to left and completed wheel is delivered to the floor, while the blank is positoned on the turntable.

No Delays — Turntable of the machine makes a 120-degree turn, putting the blank in position for boring, moving a second wheel from boring position to facing position and moving a third wheel into position for removal by tongs. Only two pairs of tongs are used at once, while a third pair permits use of two pick-up piles and two deliver piles, lessening possibility of delay.



MOTOR-DRIVEN LIFTING TONGS
. . . little possibility of delay

Finding THE RIGHT WIRE CLOTH *to fit* YOUR PRODUCT



Finding the right wire cloth to fit precisely the job it has to do in your product means more than the right type and size of wire, or mesh, or type of weave. It must be right metallurgically—to fit into your fabrication processing. It must be right chemically—to fit, or combat, product-in-use conditions. If it is Reynolds wire cloth it will be *right*—precision processed to your specifications. Details in *Sweet's Product Design File* . . . or consult Reynolds Engineers without cost or obligation.

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ATHENIA STEEL—*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD—*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
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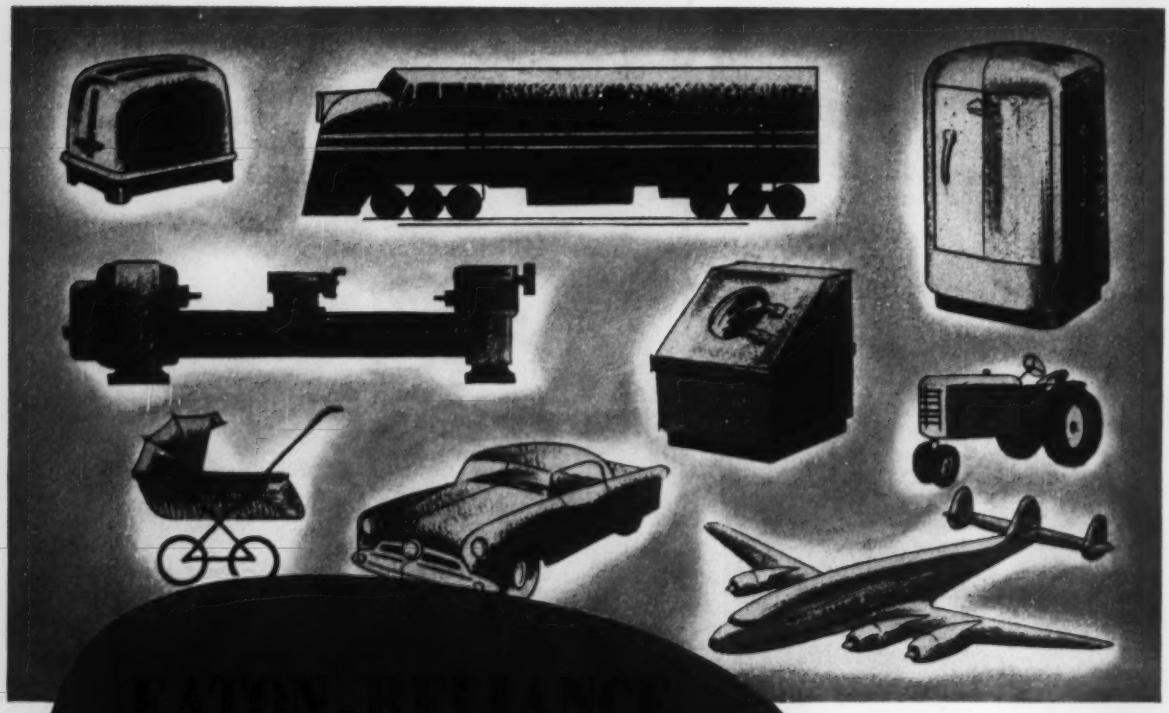
WORCESTER WIRE WORKS—*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes



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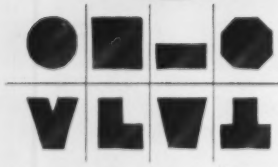
Industrial fasteners help produce these products better, faster and for less

BETTER, FASTER

Eaton Standard Springtites and Sems speed production by combining spring washer and bolt or screw into one easily handled part. Engineering Bulletin S-49 has all the details.

Reliance Spring Lock Washers, available in all types, sizes and analyses, keep bolted assemblies *tighter longer*. For complete lock washer information, write for Engineering Bulletin W-50.



Reliance Cold Finished Steel is available in rounds, squares, flats or special shape sections in wire sizes 020 x 020 x ½ to ⅝ in coils or cut to length. Write direct for information on sizes, shapes and analyses.

Reliance Hex-Fas-Ners save time and money wherever rubber, plastic or fabric hoses are used. Rust resistant, re-usable, one piece design . . . maintain uniform automatic tension. Write for Engineering Bulletin No. 1.

Reliance Snap Rings save man hours and material on shaft assemblies, bearing applications and in counterbore assemblies. Shoulders quickly formed by machining a groove and snapping in a Reliance ring. Send for Bulletin 4K/3.

Eaton Thread-Cutting Springtites and Sems eliminate tapping when fabricating products. They cut their own threads as they fasten assuring perfectly mated, tightly seated threads. Full information in Engineering Bulletin S-49A.

RELIANCE DIVISION

EATON MANUFACTURING COMPANY

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New Materials

Titanium Alloy for Bar, Forging Applications

A TITANIUM ALLOY, double melted MST 3A1-5Cr, a ternary titanium alloy with 3 per cent aluminum, 5 per cent chromium and less than 0.1 per cent carbon, was developed primarily for bar and forging applications. Outstanding characteristics are its good creep resistance and high strength properties, both at room and elevated temperatures.

How Formed—The alloy is produced by the unique double-melting process developed by Mallory-Sharon Titanium Corp., which results in complete alloy homogeneity and consistent quality. It gives the alloy its excellent forging and good machining characteristics.

Extensive tests conducted on the alloy have indicated that ultimate strengths to 165,000 psi could be obtained with more than 6 per cent elongation. However, experience with production ingots weighing up to 2000 pounds indicates that predictable strengths will be somewhat lower than this value while elongation will increase considerably.

Controlled Ingredients—In addition, alloying ingredients can be controlled with great precision, and the content of carbon and other impurities can be held as low as the amount inherent in the sponge raw material.

MST-3A1-5Cr is available in billet, bar, rod forging, extrusion or plate form. Plates can be supplied to a minimum thickness of ¼ inch. The alloy is being used widely for fabrication of jet engines.

Aluminum Alloy for Use in Welded Assemblies

TYPICAL MECHANICAL PROPERTIES OF K186

	TEMPER			
	0	H32	H34	H112
Tensile Strength (psi)	38,000	42,000	47,000	39,000
Yield Strength (psi)	17,000	30,000	37,000	19,000
Elongation (% in 2")	22	12	10	14

AN ALUMINUM ALLOY, K186, high strength and non-heat-treatable, is especially designed for weldability and adaptability to structural applications meeting the growing demand for a high-strength common alloy for use in welded assemblies.

It has been specifically developed to extend use of aluminum where heat-treatable alloys have been too costly in the past or inadequate in physical or mechanical properties.

Typical Applications—Developed by their department of metallurgical research, Kaiser Aluminum Corp. reports some applications to unfired pressure vessels, structural towers, welded boat hulls, rocket motor tubing.

The alloy is available in sheet and plate form, in a full range of tempers. An extrusion development program is currently under way to extend application range.

Tests Made — Test inert gas shielded arc welds made on 0.250 gage K186 hot-rolled plate illustrate the excellent welding characteristics of the metal. The average results of 10 tensile tests made in the longitudinal (rolling) direction of the plate showed joint efficiency with weld beads on was 89 per cent; with beads machined flush, 79 per cent.

Nominal composition of K186 is 4.0 per cent magnesium, 0.45 per cent manganese and 0.10 per cent chromium. Formability of K186 has been determined as good, cold forming in H112 temper is good. Excellent formability is obtained when the material is heated to 400° F. Tests conducted have shown excellent corrosion resistance characteristics. Standard finishing procedures may be used and corrosion resistant anodized finishes applied.

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You get exactly the gage, weight and size you specify

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You can't go wrong with quality at U. S. Steel Supply. All our sheets and strip are top-quality United States Steel products—produced under close quality supervision every step of the way. It's good to know, too, that your emergency orders (to complete production runs) can be quickly filled by U. S. Steel Supply with the exact quality and specifications you need. You don't have to waste valuable production time if you run out.

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UNITED STATES STEEL

UNITED STATES STEEL

NEW PRODUCTS and equipment

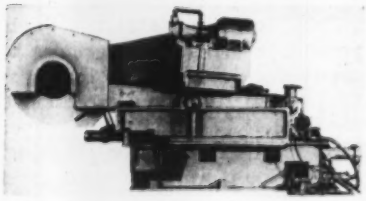
Reply card on page 137 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Cross-Cut, Drop Saw

. . . two-type blade feed

An automatic, 48-inch combination cross-cut and drop saw capable of cutting two 7 x 7-inch billets side by side also features either vertical or horizontal blade feed.

It's entirely hydraulic-operated, with special feed-back controls to provide constant use of maximum



horsepower, regardless of the varying thickness of the material being cut. When used as a cross-cut saw, the blade lifts out of the hot zone and returns to initial position, enabling workmen to clear the table and move the product quickly into position for further cutting. Peripheral blade speed of this 150-hp saw is over 20,000 fpm. York-Gillespie Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 1

Wet Dust Collector

. . . solves unusual dirt problems

The Type CW-1 centrifugal wet dust collector is of counter-current design and of tower type construction. It consists of multiple wet vane sections and a final water entrainment vane section. The diameter of the collector varies in proportion to the air volume handled, and the number of wet vane sections is governed by application requirements.

The collector was designed to solve those dust control problems which cannot be solved by use of cloth type collectors as the control of high temperature or moisture, explosive or combustible dusts, corrosive, highly abrasive and/or obnoxious dusts. Pangborn Corp.

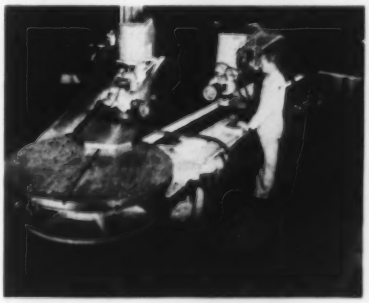
FOR MORE DATA CIRCLE REPLY CARD NO. 2

Forming Machine

. . . in carousel model

A stretch-wrap forming machine features full 360-degree arm rotation. The operator rides either arm during forming.

The Hufford Carousel has been designed in conjunction with Douglas Aircraft, El Segundo Division, to expedite formation of parts now employing several types of machines. It is believed with the many types of forming incorporated on one machine that forming



costs can be materially reduced because a great deal of hand forming has been eliminated, as well as second operations and handling time. The machine is capable of producing many parts heretofore impossible by a single machine, but still produces all conventional parts from both extrusions and sheets up to 22 inches wide. Hufford Machine Works Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Ice Removing Chemical

. . . rust inhibitor added

Addition of a combination rust inhibitor and heat-retaining agent to its X-73 ice-removing chemical

granules is announced. Phosite is said to increase thawing effectiveness and to protect metal against rust action resulting from snow, etc.

It is applied by scattering lightly over icy surface. It is said to have a tendency to spread itself and to reduce the winter cost of cleaning steps, walks, drives, etc. X-73 is packed in 100-200 and 300-pound fiber drums. Ton lots are shipped in 100-pound waterproof bags. Monroe Company Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Slitting Line

. . . completely integrated unit

A modern slitting line, 4LS-700-48-2H, built by Kane and Roach consists of an uncoiler drum, four-segment type which is expanded and contracted by a non-rotating hydraulic cylinder. Slitter arbors are driven through universal joints from a spreader type gear box connected to the motor which is mounted on the slitter base. The

Removable Ready-Power Units

give you off-the-truck maintenance

Keep trucks *on the job* where they belong!

If you *like* the simplicity, economy, and full power of gas-electric or diesel-electric drive . . . if you *like* the idea of engine tune-up without truck downtime . . . READY-POWER IS THE ONLY ANSWER. Power units may be installed or removed from trucks *in minutes!* Sizes for all makes and types of electric industrial trucks. Write for details.

READY-POWER

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

NEW PRODUCTS and equipment

scrap chopper consists of rotating cutter head equipped with sectional cutting blades extending the full length of the head and a stationary mounted sectional blade

extending the full length of the head.

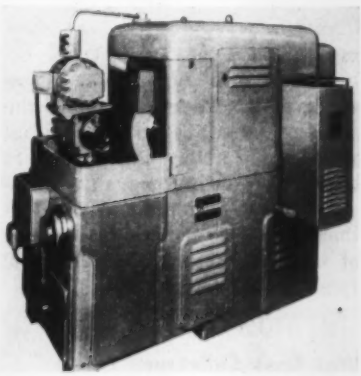
The recoiler drum can be furnished either as a manually or hydraulically operated expanding type. A coil stripper is provided consisting of a heavy pusher plate supported on large diameter rods. Kane & Roach Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

Plunge Form Grinder

. . . versatile, easily set up

The Model E automatic high production plunge form grinder is compactly designed (44 inches x 78¼ inches) affording exceptional accessibility and simple setups. Versatile, it is used for chucking work, center work or shoe type



grinding; crush wheel or diamond trueing; with automatic or manual handling.

Completely automatic cycle, high speed approach, wheel feed, sparkout and withdrawal are positively controlled through simple cam action. The wheel slide is held against a positive stop with uniform hydraulic pressure for automatic, positive size control. Automatic trueing provides controlled dressing, one piece or once

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 90,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength in accordance with SAE Grade 5. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength in accordance with SAE Grade 2. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

* SPECIALS furnished to BLUE PRINT SPECIFICATIONS

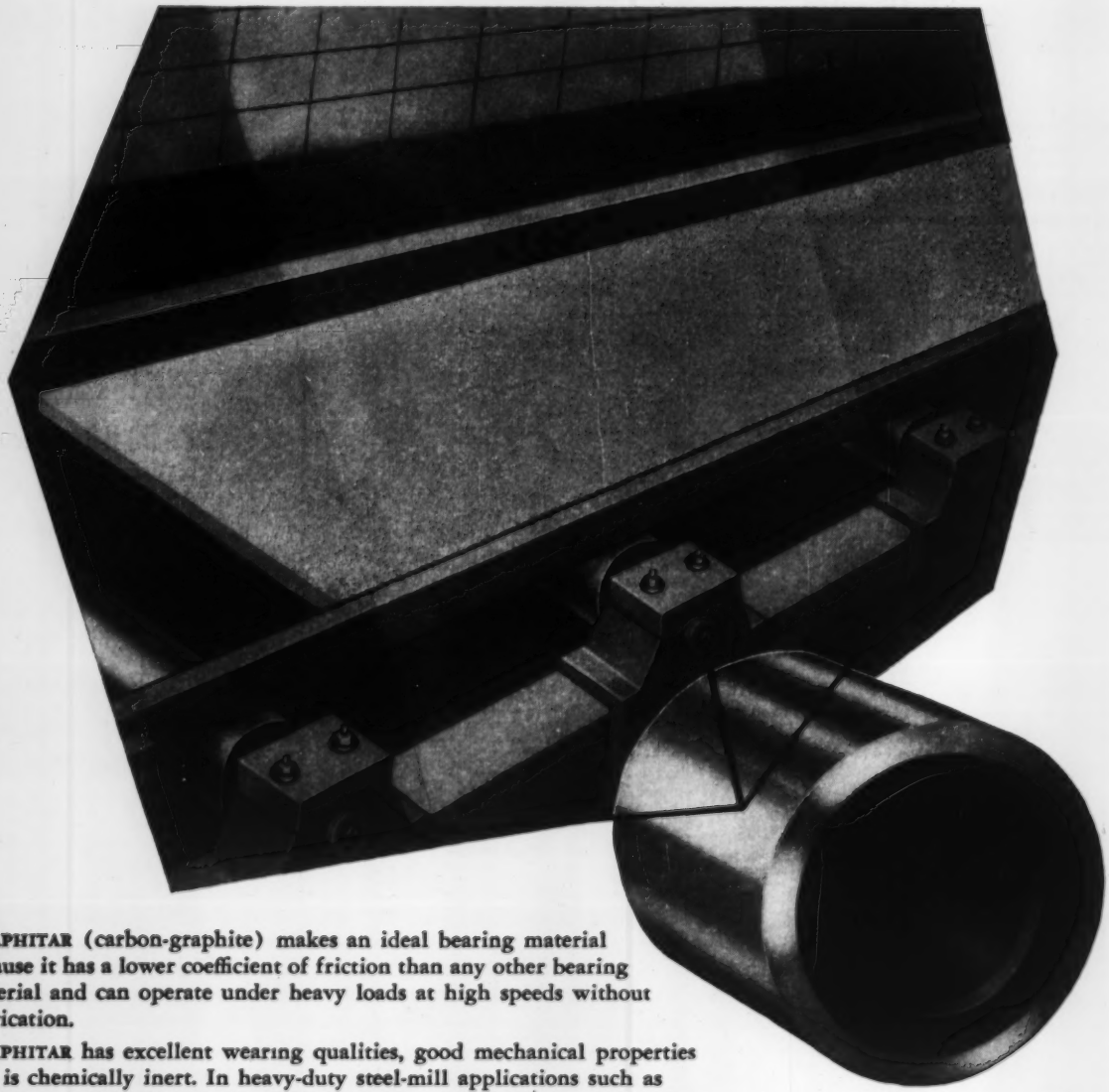
WRITE FOR INFORMATION

SEND FOR SAMPLES

GRAPHITAR.

METAL-BACKED BEARINGS FOR THE STEEL INDUSTRY

Metal-backed GRAPHITAR bearings provide exceptional strength and durability for long life in difficult steel mill applications



GRAPHITAR (carbon-graphite) makes an ideal bearing material because it has a lower coefficient of friction than any other bearing material and can operate under heavy loads at high speeds without lubrication.

GRAPHITAR has excellent wearing qualities, good mechanical properties and is chemically inert. In heavy-duty steel-mill applications such as shear or cut-off tables, coil and slab conveyors, the GRAPHITAR bearings are metal-backed to provide additional strength and resistance to shock. GRAPHITAR metal-backed bearings can be supplied in tolerances as close as .0005" ready for installation.

183

OUR 100th YEAR

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN

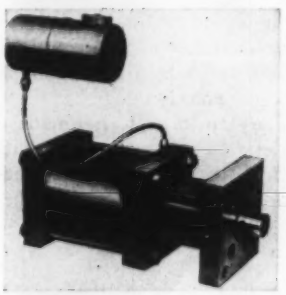
per any predetermined number of pieces. Maximum diameter of swing over table is 13 inches. Maximum length between centers, 7½ inches up to 32 inches. Jones & Lamson Machine Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 6

Air Power Head

. . . weighs about 100 pounds

The Model D 50 Air Power Head has a one-inch stroke, attains 5-tons pressure, and is suitable for such general production operations



as pressing, staking, riveting, etc. It operates on air pressures up to 150 pounds with a ratio of 100 to 1. Over-all size is 6½ x 6½ x 16 inches. Gross weight is about 100 pounds.

The ram is 1½ inches in diameter and well-adapted to mounting tooling, punches, etc. Model D 50 can also be furnished in varying sizes and capacities, according to customer specifications. Air-Hydraulics Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Reproduction Machine

. . . makes small copies

A low cost, tabletop direct reproduction machine has been designed for use in the engineering, drafting and architectural fields.

It has an operating speed of 12 fpm and has a printing width of eleven inches. Consequently it can be used to make copies of the

the A-B-C of M-S-T

A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS
C AT LOWER COST

Michigan Electric Resistance WELDED STEEL TUBING

A Quality Product

Muffler Inlet Pipe

This is an excellent example of Michigan workmanship in the performance of several intricate fabricating operations to most exacting tolerances.

The pipe manifold end is expanded to 2.225" I. D., a flange superimposed, and a flanged ferrule press-fitted for immediate assembly to exhaust manifold. Two bending operations with minimum reductions permit full flow of gas to hold back-pressure to a minimum. Muffler end diameter of tube is increased by expanding and a bead superimposed to form a "gas-tight" joint.

Michigan engineering and fabrication know-how make for accuracy and economy in the manufacture of this and many other tubular products. Why not consult Michigan about your fabrication problem.

ROUND
⅜" to 4" O. D. 8 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" O.D. 20 gauge
1" to 2¼", 14, 16, 18 gauge
Carbon 1010 to 1025
Michigan Tubing
has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Michigan STEEL TUBE PRODUCTS CO.
RESISTANCE WELDED STEEL TUBING
THE OLDEST NAME IN ELECTRIC

More than 35 Years in the Business
9430 BUFFALO STREET • DETROIT 12, MICHIGAN
FACTORIES: DETROIT, MICHIGAN—SHELBY, OHIO

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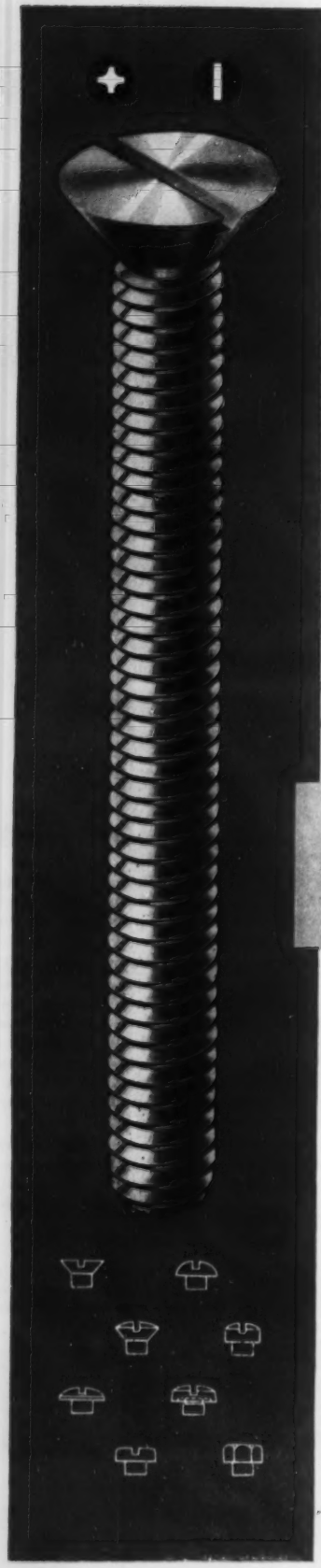

Whatever type of machine screw you need, Blake & Johnson has it . . . or can make it for you. Slotted or Phillips heads — in brass and steel, plain or plated. Special designs, sizes, and finishes to order. Blake & Johnson is the dependable source for Twin-Fast® wood screws, stove bolts, tapping screws, special headed products, machine screw nuts, rivets, chaplets, wire forms, automatic screw machine products . . . in steel, brass, or other alloy metals.

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fastenings

BLAKE & JOHNSON

SINCE 1849

WATERVILLE 48, CONNECTICUT

NEW PRODUCTS and equipment

smaller size drawings which form a large part of reproduction work.

The Series 100 is a completely self-contained copying unit based on the diazo direct copying process. It makes positive copies directly from the original of anything drawn, written, printed or typed on ordinary translucent paper. Charles Bruning Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

End Dump Truck

. . . built to customer specs

A simple lock releases the contents of this dump truck. After discharging, it requires practically no effort to return the hopper to original position.

The trucks can be made in a variety of capacities without imparing the dump-return facility.

They come with wheels or pallet-type skid base for use with fork lift trucks. Another option is a flange on either side along the top edge of hopper for transporting via overhead handling equipment. Thick gage metal is used for durability. It's built to specifications. Klass Machine & Mfg. Co.

FOR MORE DATA CIRCLE RTPLY CARD NO. 9

Cast-Iron Welding Rod

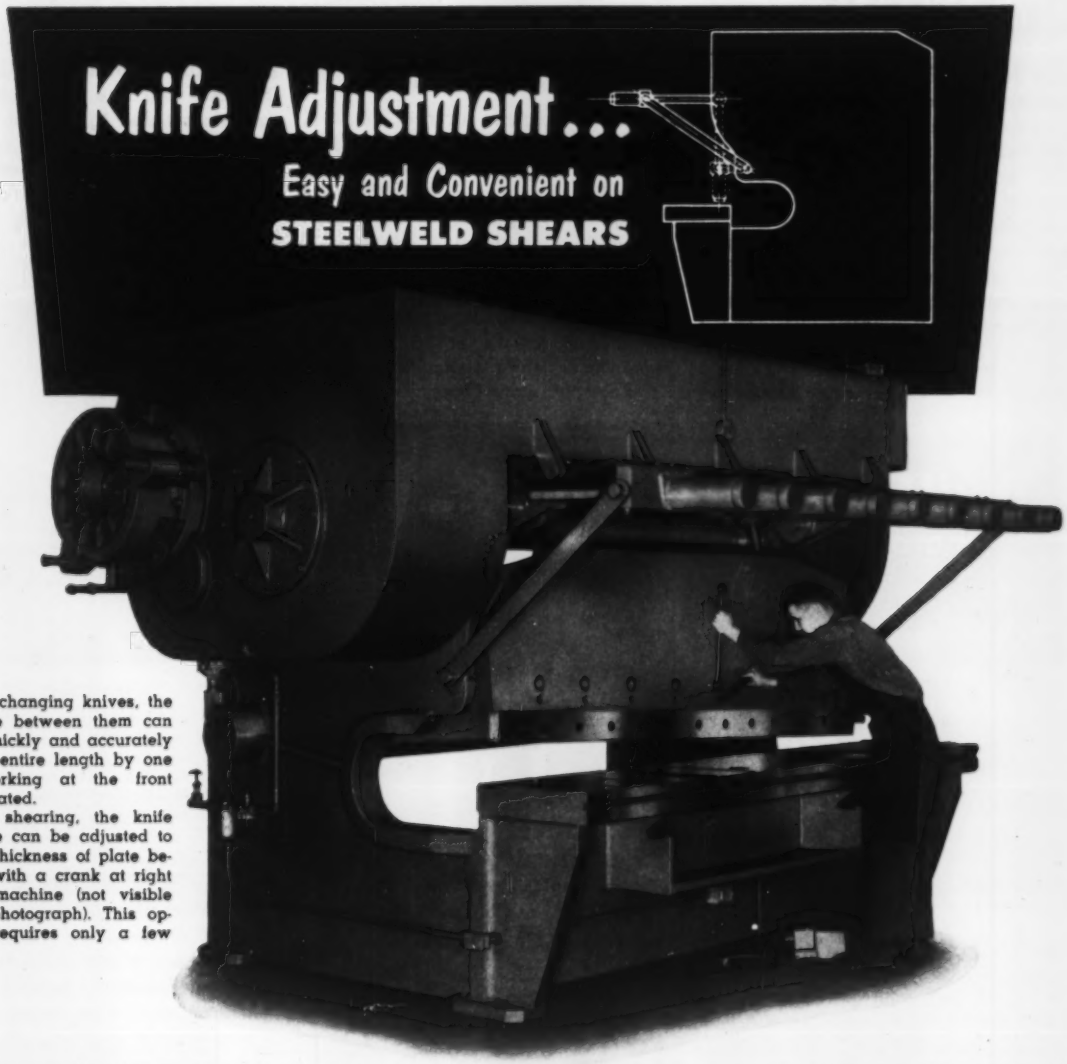
. . . blow-hole-free welds

A copper-coated cast iron welding rod, metallurgically compounded so that the average torch welder can easily get strong machinable welds that are free from blow holes, has a lower working temperature and requires less preheat than the rod it will replace in the All-State line. The copper coating prevents the rusting common to cast iron rods and accounts in some measure for its excellent flow characteristics.

The No. 3 General Purpose Cast

Knife Adjustment...

Easy and Convenient on STEELWELD SHEARS



When changing knives, the clearance between them can be set quickly and accurately for their entire length by one man working at the front as illustrated.

When shearing, the knife clearance can be adjusted to suit the thickness of plate being cut with a crank at right end of machine (not visible in this photograph). This operation requires only a few seconds.

When the knives on a Steelweld Shear are being set parallel from one end to the other, it is not necessary to have one man at the rear of the machine turning adjustment bolts, with another man at the front gauging the knife clearance. Nor is it necessary to work between or behind the hold-downs in hard-to-reach places.

On Steelwelds the hold-down beam can be lifted out of the way and all knife adjustment bolts reached from the front of the machine. As each bolt is turned, the clearance can be checked at once. One man can make the entire adjustment in a small fraction of the time usually required.

After the knives have been set for parallel, the clearance between them can be adjusted to suit various plate thicknesses to obtain the best possible cuts. This can be done in a few seconds by turning a crank and watching a dial indicator.

Because knife adjustments have been made so convenient on Steelwelds, shear operators will make them gladly and without hesitation. This contributes greatly to accuracy and quality of cuts and assures long knife life.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7838 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

Iron Rod is recommended for repairing breaks and cracks, filling blowholes, building up worn parts and for other salvage or production work. No. 1 Brazaloy Flux powder is needed. The No. 3 is available in 3/16 and ¼-inch diameters.

The rod length is 18 inches, and standard package is 10 pounds. All-State Welding Alloys Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Roughness Scales

. . . consist of two scales

The cylindrical surface roughness scales consist of two scales each six inches wide and two inches long and are ideal for determining the roughness of surfaces produced by grinding, lapping, honing, superfinishing, turning, boring, drilling etc. Scale number one is capable of determining the surface roughness of 10 specific surfaces. Surfaces on this scale are both external and internal. On scale two, the typical surfaces are represented by turned as well as bored surfaces.

Surface roughness on both scales is specified by numbers

stamped on the units' sides which represent the arithmetic average deviation from mean surface in microinches. General Electric Co.

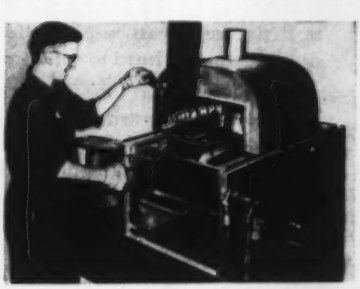
FOR MORE DATA CIRCLE REPLY CARD NO. 11

Core Making Machine

. . . will not disintegrate

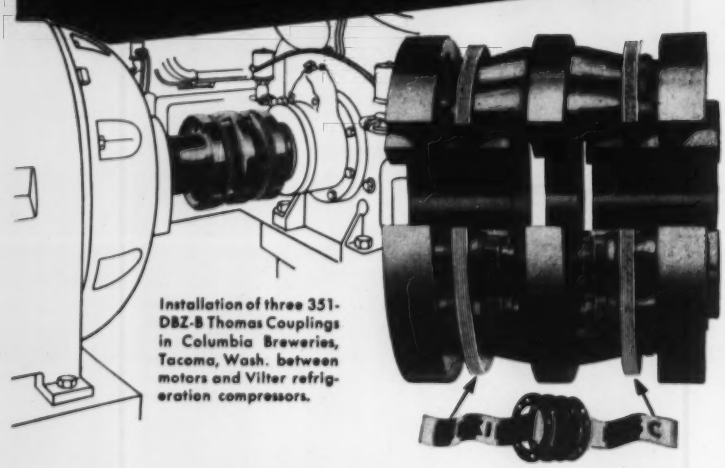
Gee machines are designed to use any metal pattern which will not disintegrate at the desired operating temperature. It will make shells and cores simultaneously when necessary, as long as the patterns and core boxes will fit under the dump box. The shell size is controlled to the exact size of the mold. Visible shell defects can be repaired while they are on the machine.

Model SC-1418 accommodates



any pattern up to 14 x 18 inches which requires a stripping action of up to 6 inches. It will also accommodate a core box with a base size up to 14 x 18 inches and a height of 6 inches above the roll-over frame. The Model SC-2030

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

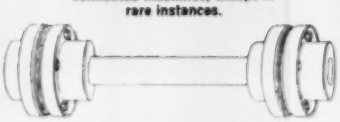


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FEATURE	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

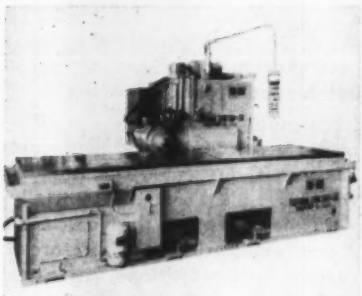
accommodates a pattern up to 20 x 30 inches with a stripping action up to 6 inches. Metco Processing Corp. and Gladwin Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Milling Machine

. . . for nonferrous metals

The No. SM-100 open-side scarf and edge milling machine is intended primarily for use on nonferrous metals. Mounted on a vertical column, the machine's horizontal spindle head can be adjusted to tilt a maximum of 30 degrees either above or below the center line. The spindle head is driven by



a 15/30-hp, 1800/3600-rpm motor and is equipped with a No. 50 standard milling machine taper.

Work table measures 36 inches by 144 inches. Traveling on one "V" and one flat way, the vertical column incorporates a variable feed rate ranging from 10 inches to 200 inches per minute. The work table and herringbone rack can be extended at one or both ends. Machine is furnished with pendant controls. Ekstrom, Carlson & Co.

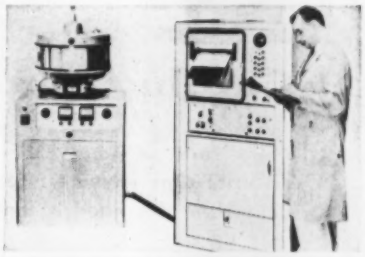
FOR MORE DATA CIRCLE REPLY CARD NO. 13

X-Ray Quantometer

. . . for chemical analysis

The reflecting, curved crystal x-ray spectrometer which, combined with a recording console, has been designed specifically for the rapid nondestructive chemical analysis of metals, powders and liquids, is an instrument employing the techniques of x-ray fluorescence spectrography and is a powerful new tool for chemical analysis.

The combination of multichannel recording and use of the curved crystal spectrometers has made possible increases in sensitivity, precision and speed of analysis to



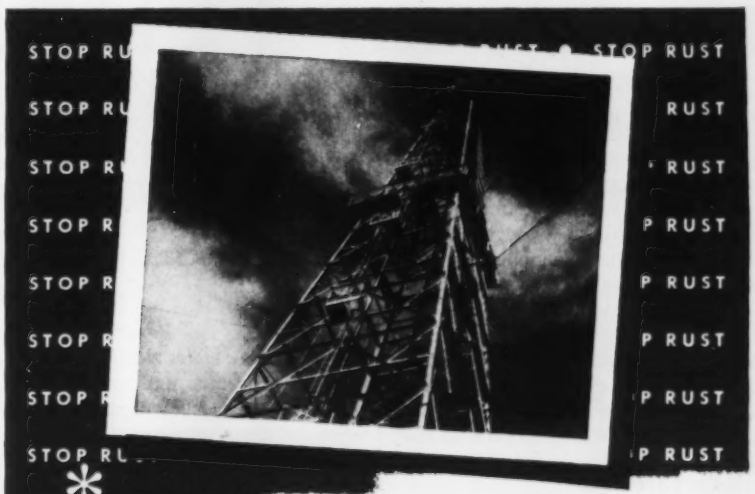
such an extent that the usefulness of the method has been greatly extended. Applied Research Laboratories.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Spray-Coolant System

. . . for rapid evaporation

A Spra-Kool system for quickly and economically applying spray-coolant to any type of dry grinding or polishing operation, as well as certain drilling, milling, chamfering, or boring operations that do not require flood coolant is de-



It's Hot-Dip Galvanized

Half a football field high and all galvanized, this oil derrick manufactured by the Lee C. Moore Corporation stands up to rugged western weather all the year round.

Angles, stairs, platforms, bolts and nuts, from top to bottom, have to be protected from rust.

Hot-Dip Galvanizing was selected. Here's why: With Hot-Dip Galvanizing you get the thickest, most uniform coating with no open pores to let rust begin—thus costly maintenance is reduced to a minimum and necessity for replacement is eliminated. The original cost of Hot-Dip Galvanizing is economical too. Ready for erection, galvanized structures will not flake off. A thick, uniform coating means complete protection throughout. Sealed in zinc, the tower will not rust.

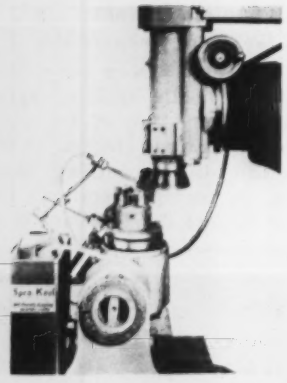
Whether it's an industrial tower or a garbage can for your back yard, remember if it's iron or steel, have it Hot-Dip Galvanized. For the best in galvanizing, send your products to a member of the American Hot Dip Galvanizers Association—he has the know-how to give you a top quality job.

Send today for our new booklet "Stop Rust." It gives you the full story on the process, plus a comprehensive coating comparison chart. "Must It Rust" 16 mm film available for showing.

AMERICAN HOT-DIP GALVANIZERS ASSOCIATION

1506 FIRST NATIONAL BANK BLDG., PITTSBURGH 22, PA.

signed with a simple valve and spray nozzle which provides a steady, uniform jet spray of coolant to tools and work. The system combines the advantages of



rapid evaporation and forced air jet penetration at the point of work-wheel contact.

By eliminating dry grinding, the new system provides longer wheel life, reducing the tendency of soft wheels to break down and hard wheels to load. It also prevents damaging work from excessive heat. A rust inhibitor mixed with the coolant also prevents tarnish and rust stains. Bar Products Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

All-Purpose Flux

. . . for clean base

This flux dissolves oxides of metals and provides a clean surface as a base for a firm union of solder and metal. It fluxes through oily or rusty surfaces and is non-acid and self-cleaning. It

dissolves oxides of metals instantly, eliminating unnecessary cleaning.

With average workmanship and precaution against extreme overheating, joints made with La-Co flux will hold up for the life of the system. Highly active even though joints are made up to 48 to 72 hours prior to soldering operation. Lake Chemical Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 137 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Electric Fork Trucks

Lewis-Shepard Products Inc.—A preventive maintenance chart for electric fork trucks shows proper steps to be taken for daily, weekly and monthly inspections. Each chart covers 8 weeks of truck operation. The maintenance report is fully illustrated to show principal maintenance locations.

FOR A FREE COPY CIRCLE REPLY CARD NO. 17

Buff Selector

American Buff Co.—A 17 x 22-inch buffing calculator and buff selector wall chart will help buffing shop foremen and operators to save time and eliminate guesswork in the right buff, the right size and the right speed for every buffing job.

FOR A FREE COPY CIRCLE REPLY CARD NO. 18

Dial Feed

Sciaky Bros. Inc.—Bulletin No. 319-12 covers Sciaky dial feed, the universal, rotary indexing unit for applications on resistance welders, machine tools and various assembly operations. Shockless start and stop, positive positioning, independent control of functions and dial feed specs are covered.

FOR A FREE COPY CIRCLE REPLY CARD NO. 19

Worm Gear Drives

Cleveland Worm & Gear Co.—"Keep 'em Rolling" is intended to show why you should choose Cleveland worm gear drives. Application of the drives is given in case history fashion. The booklet is illustrated and lists the field offices of the company.

FOR A FREE COPY CIRCLE REPLY CARD NO. 20

Stationary Batteries

C & D Batteries Inc.—Specification bulletins CP-536 and CP-537 cover C & D's complete line of lead-calcium and lead-antimony batteries for control, switchgear and auxiliary power applications. The specifications include data on battery ratings and capacities, details of design and construction, dimensions, weights and types of containers.

FOR A FREE COPY CIRCLE REPLY CARD NO. 21

Reinforced Plastics Presses

Hydraulic Press Mfg. Co.—Pictorial story of molding reinforced plastics is presented in bulletin No. 5404. Presented pictorially are only a few of the multitude of new applications for reinforced plastics. Specifications of their presses are included in the 8-page bulletin.

FOR A FREE COPY CIRCLE REPLY CARD NO. 22

Double Crank Presses

Niagara Machine & Tool Works—Information covering the Niagara line of straight side double crank presses is illustrated as well as informative. Described are their fully enclosed design, one-piece and four-piece frame construction, box-type slides, low inertia clutch, clutch control, lubrication and optional accessories.

FOR A FREE COPY CIRCLE REPLY CARD NO. 23

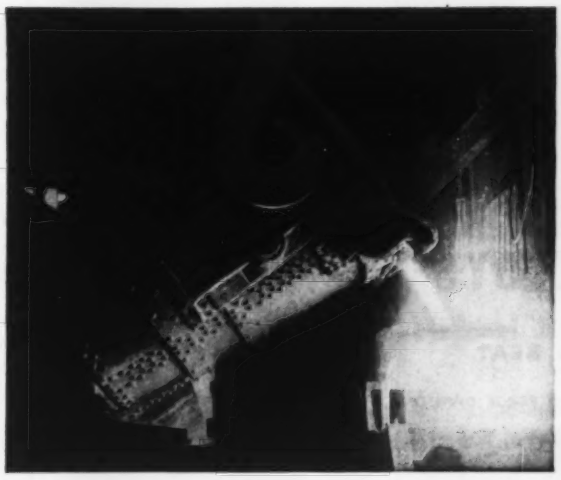
Temperature Measurement

Tempil Corp.—An informative discussion of "How Temperatures Are Measured" includes these subjects: Temperature Scales, Temperature Effects, Temperature Measurement by Color, Temperature Measurement by Chemical Signal, and Tempil Lacquer, Crayons and Pellets.

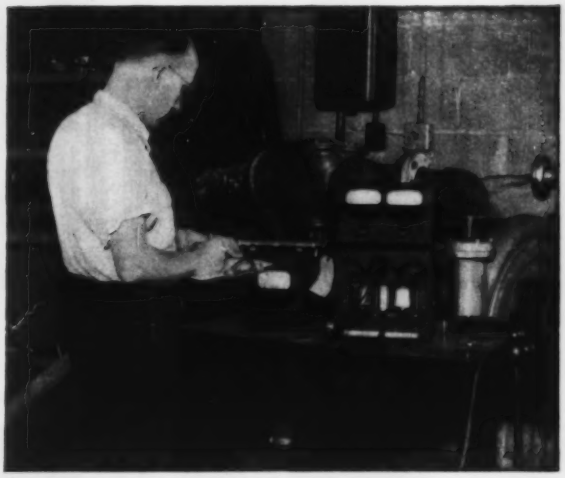
FOR A FREE COPY CIRCLE REPLY CARD NO. 24

Steel Mill Equipment

York-Gillespie Mfg. Co.—Special automatic and semi-automatic machinery, auxiliary steel mill equip-



STEEL OUTPUT INCREASED BY 110 TONS PER DAY REPORTS STEEL PRODUCER: Tap-to-tap time reduced from 18 to 12 hours . . . Fuel cut 46% per ton produced . . . Tonnage up 50% daily! That's the job Cities Service Heat Prover helped perform for one of the largest steel producers.



"COMPLETED 30 HOUR TEST IN JUST 6 HOURS!" "We completed what normally would have been a 30 hour test in just 6 hours," writes the Eclipse Fuel Engineering Co. of Rockford, Ill. "We found the Heat Prover equally exact, perhaps more exact than standard commercial testing equipment."

INDUSTRY REPORTS ON FURNACE OPERATION:

PRODUCTION UP, COSTS DOWN WITH CITIES SERVICE HEAT PROVER

THE CITIES SERVICE HEAT PROVER . . . Not an instrument that you buy . . . but a service we supply . . . **FREE!**

Shown above are just two of the many outstanding accounts of the Heat Prover's impressive accomplishments. Wherever a furnace operation is involved, the Heat Prover can help increase productivity by providing:

- **Rapid, continuous sampling**
- **Simultaneous reading of oxygen and combustibles**
- **Direct measurement of oxygen and combustibles**
- **Easy portability**
- **Free maintenance and re-calibration service**

Learn how the Heat Prover, supplied and maintained free by Cities Service, can benefit you. For details, contact your nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York City 5, N.Y.

See The Heat Prover in action at the Cities Service Exhibit at the Iron and Steel Exposition, Cleveland Auditorium, Sept. 28-Oct. 1. Booths 483 and 484.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

ROLOCK
FABRICATED ALLOYS

BASKET SERVICE THAT'S HARD TO BEAT

AT WILLYS MOTORS, INC. ALUMINUM FORGE DIVISION

Shown in action is one of 24 similar stainless steel etch baskets designed and fabricated by Rolock Incorporated. Dimensions are 6′ x 3′ x 16½″; load is 500 lbs. of aluminum forgings . . . thru the following 6-cycle operations:

A. Acid pickle, 10% sulphuric acid, 3% chromic acid solution at 160° F.
B. Cold water rinse.
C. Etch in 10%-15% caustic solution at 160°-180° F.
D. Cold water rinse.
E. Bright dip in 10% sulphuric acid, 3% chromic acid solution at 160° F.
F. Hot water rinse.

EACH BASKET has been subjected to an average of 125 cycles per month for more than SIX YEARS . . . and they're still going strong . . . after a total of about 10,000 cycles. THAT IS SERVICE!

This Case History is another demonstration of the value of Rolock engineered-to-the-job, fabricated-welded design and construction of containers for handling metal parts.

Extended service life reduces costs materially, improves the work, cuts time. Rolock design and construction raises the ratio of load to basket weight, thus again reducing costs.

Rolock engineers welcome your inquiries for baskets, trays, racks, crates, fixtures, retorts, muffles, vessels, kettles, etc., for heat and corrosion resistant applications.

Send your tough problems to us for solution. We welcome the challenge.

SALES AND SERVICE REPRESENTATIVES FROM COAST TO COAST

ROLOCK INC. • 1262 KINGS HIGHWAY, FAIRFIELD, CONN.

for better work
Easier Operation, Lower Cost

6RL94B

ment and material handling equipment are described in a 4-page folder. The folder details the complete machine shop facilities and fabrication service offered by the company.

FOR A FREE COPY CIRCLE REPLY CARD NO. 25

Hardness Testers

American Chain & Cable Co. Inc.—A comprehensive, illustrated catalog, giving engineering data, uses, design features of the complete line of hardness testers, has been prepared by the Mechanical Instrument Division. In four sections, the catalog details the scope of Rockwell application in industry.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Beryllium Alloys

Penn Precision Products Inc.—Bulletin 3, "Beryllium Casting Ingots and Master Alloys," presents general information on beryllium-copper, beryllium-nickel, beryllium-aluminum and beryllium-iron alloys available in ingot form for remelting. It describes various uses for these beryllium products and includes tabular data on composition and properties.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Jig Borer

Niles-Bement-Bond Co. — Pratt & Whitney Division offers an 8-page brochure covering their Electrolimit jig borer, which is said to offer a new precision and productivity for a wide range of work sizes. Features, specifications, measuring system, boring bar and milling adapter are described.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Mill Machinery

Mannesmann-Meer Engineering & Construction Co.—An informative 8-page booklet, "Mill Machinery for High Production in Modern Seamless Tube Mills," describes and illustrates various basic components of steel-tube mills. Emphasis is placed on flexibility of equipment.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Lift Truck Data

Yale & Towne Mfg. Co.—Yale Materials Handling Division offers a work kit for predetermining times necessary for fork lift trucks to perform specific operations which will enable plants to

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apply standard performance data. Work sheets which can be used in evaluation of standard performance times for specific fork truck operations are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 30

Load Meter

Detroit Milling Cutter Co.—The Loadmeter, which will warn of damage to machine, damage to tool, damage to work, is described in a 4-page brochure. Its method of operation and outstanding features are listed and installation data given. Illustrated.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Brazing

All-State Welding Alloys Co. Inc.—"Brazing Manual," 24 pages, contains data for brazing shapes, sheet, castings, tubing and assemblies of copper, brass, steel, aluminum and cast iron. Clear text and diagrams explain and simplify many points in the joining operation.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Plating Automation

Wagner Brothers Inc.—Presented in easily-read editorial style, bulletin B 50-54 describes revolutionary concept in plating automation, the fully automatic plating machine. A comprehensive explanation covers the unique parts' transfer and conveying principle.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Thermocouples

Illinois Testing Laboratories—Bulletin 4181, "Alnor Pyrometer Accessories," contains specifications and performance data for Alnor thermocouples of every type and application. Also included are notes on thermocouple alloys, temperature-millivolt relationship curves and a convenient temperature conversion table.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Constant Voltage

Glenn Co.—Factual data describing the principle of constant voltage power supply and its application to inert gas, submerged arc and other automatic welding processes are given in a series of data sheets.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Diesel Engines

Sun Oil Co. — "Lubrication of Diesel Engines" has been revised and updated. Generously illustrated, it discusses diesel principles and design, types of engines in use, operating cycles, engine accessories and choice of correct diesel lubricants. A quick-reference trouble-shooting chart lists remedies for faulty performance.

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Control Valves

Ross Operating Valve Co.—Bulletin 307 describes and illustrates the Ross rotary handle action or pancake valve, a recent addition to the company's models. Bulletin 307 contains operation and recommended service information, installation data, parts list and exploded view of components.

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Investment Castings

Midwest Precision Castings Co.—"How To Design Precision Investment Castings" is an informative pocket-size booklet, profusely illustrated and written as a guide to benefits and limitations of the lost wax investment casting process. A materials chart lists phys-

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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ical properties, and use of some of the more popular metals is also included.

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Penn Facilities, Products

Penn Machine Co.—A 24-page brochure includes details on the company's planning procedures, engineering facilities, testing and inspection processes, as well as a section devoted to a great variety of parts which they are equipped to produce. 20 pages illustrated.

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Electric Tube Furnaces

Burrell Corp.—Information on high temperature electric tube furnaces produced for one, two and four tubes is available. 4 pages cover the H and the BT models and their advantages. Specifications, dimensions and ordering information are given. Illustrated.

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Evaporator

Rodney Hunt Machine Co.—An 11-page brochure covers their Turba-Film evaporator for processing liquids, slurries and gases. How it works, its installation and a film processing system are described.

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Phenolic Resin Computer

Marblette Corp.—A conversion chart that does away with computation headaches in using phenolic resins utilizes the slide-rule principle to show amounts of resin and accelerator required to produce any cast phenolic part. A table shows percentage by weight of appropriate hardener to be used with each. Another table covers applications for which each resin is suitable.

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Electronic Measurement

Consolidated Engineering Corp

Dynamic role of electronic measurement and control instruments in the changing pattern of modern industry is the subject of a 22-page booklet, "Greater Profits Through Consolidated Instrumentation." In case history fashion the vital and accelerating part played by electronic instrumentation in bringing better products at lower cost is depicted.

FOR A FREE COPY CIRCLE REPLY CARD NO. 43

Molding Machines

Hydraulic Press Mfg. Co.—Bulletin 5406 covers their line of plastic injection molding machines. It is complete with full specifications on all machines up to and including the 400-ounce-capacity and 3000-ton mold clamping force machines.

FOR A FREE COPY CIRCLE REPLY CARD NO. 44

EDITORIAL REPRINTS:

Sales Profit

Not all sales bring you a profit. Cost per sales call has nearly doubled in the past ten years. Sales costs can be cut without impairing the sales effort. For suggestions on how it can be done, see page 65.

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Special Fasteners

Many large fastener users are finding it's profitable to eliminate components and assembly steps with multifunction specials. The article on page 96 shows how design for specials is becoming standard and how it's becoming a source of production economy.

FOR A FREE COPY CIRCLE REPLY CARD NO. 46

Forging Titanium

Many grades of titanium and its alloys are commercially forgeable. Their chemistries make it possible for them to be readily hot-worked without undue critical attention or high scrap loss—both factors that affect normal forging costs. For a description of how one company does it, turn to page 100.

FOR A FREE COPY CIRCLE REPLY CARD NO. 47

Hydrostatic Lubrication

Hydrostatic lubrication has been called a way to break the law of friction. The secret is that bearings always have a supply of lubricant. This includes such conditions as starting and stopping, slow speeds, reciprocating motion and excessive loads. On page 118, you'll find how it works.

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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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Market Outlook

LOOK to the construction industry as a good source of business for a long time to come.

Not only is that industry booming but a $75-billion backlog of needed construction is piling up, construction industry authorities say. Even if there are no further additions to this backlog it will represent a five-year building program at present rates of construction.

STANDING ROOM ONLY— Among the needs are schoolrooms. A deficiency of 340,000 classrooms in this country is reported, and the deficiency is increasing every year as children from the heavy birthrate of the postwar years move into school.

This year, school projects are to a large extent responsible for a 4-per-cent rise in nonresidential public building construction.

Commercial building for this year is expected to reach a new high of more than $1 billion, up 15 per cent from last year.

PAVING THE WAY— Bridge construction is up 14 per cent in dollar volume. Highway awards also are expected to be up 14 per cent this year, largely because of toll road and turnpike projects. The highway building program is expected to continue growing because the present road system, built to carry 35 million autos, is handling about 53 million, and because the surface of the roads, now a dozen years old on the average, is wearing out rapidly under the heavy traffic. Out of every dollar spent in highway construction nearly 9 cents goes for steel.

PROOF— The high rate of construction is reflected in mill shipments of steel in the first half of this year. Heavy structural shapes comprised 7.4 per cent of the tonnage of finished steel shipped by mills, compared with 5.8 per cent in the corresponding period of last year. Other construction products and their percentages in the first half of this year compared with the like period of last year are: Reinforcing bars, 2.6 vs. 2.2; steel piling, 0.6 vs. 0.4; line pipe, 4.5 vs. 4.2.

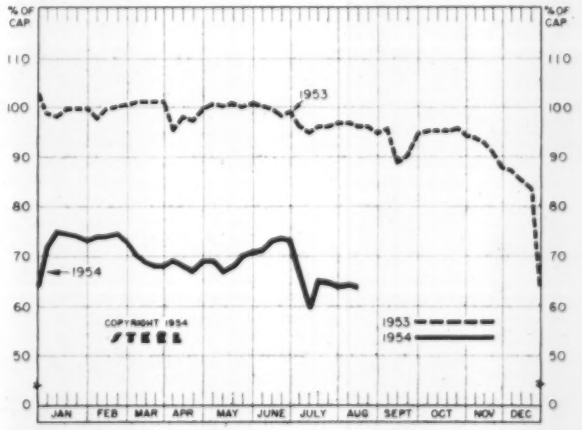
The high rate of construction can be seen also in the rise in the construction industry's stature as a steel buyer. In the first half of this year, construction and maintenance and contractors took 19.2 per cent of the tonnage of finished steel shipped by mills. In the corresponding period of last year they received 15.6 per cent.

FAITH IN THE FUTURE— Indicative of the faith placed in the future of the construction industry is Bethlehem Steel Co.'s modernization and expansion of facilities for producing wide flange structural shapes at its Saucon division, Bethlehem, Pa. The division's capacity is being raised 50 per cent.

BUSINESS BUILDER— Not only does construction take steel for framework and reinforcing but it paves the way for other goods made of metal. Equipment is needed to help with the construction, and equipment is needed for use in and with structures after they are completed.

OUTPUT LAGS— Because all businesses are not riding as high as the construction industry, over-all demand for steel remains sluggish. As a result, steel ingot output in the week ended Aug. 15 eased off half a point to 64 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Aug. 15	Change	Same Week 1953	Same Week 1952
Pittsburgh	62	+ 1*	93.5	90.5
Chicago	68	— 0.5*	104	98
Mid-Atlantic	57	0	96	87
Youngstown	65	0	103	90
Wheeling	78	0	95.5	89
Cleveland	60.5	+ 1*	102.5	100
Buffalo	56	0	106.5	109
Birmingham	64.5	—10.5	94.5	97
New England	55	+10	90	80
Cincinnati	54.5	— 3	91	50
St. Louis	54.5	+ 7	103	104
Detroit	56.5	0	108	103.5
Western	83	+ 1	102.5	102.5
National Rate	64	— 0.5	96	94.5

INGOT PRODUCTION‡

	Week Ended Aug. 15	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	94.6†	95.1	95.5	133.6
NET TONS (In thousands)	1,519†	1,527	1,534	2,146

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,469 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 45 Technical Outlook—p. 95

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Aug. 10

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525	Bars, H.R., alloy	8.783	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.917	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.088	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.275	Bars, H.R., carbon	5.023	Pipe, black, buttweld (100 ft)	15.000	Black plate, can making quality	6.233
Axles, railway	7.500	Bars, reinforcing	5.058	Pipe, galv., buttweld (100 ft)	18.310	Wire, drawn, carbon	7.938
Wheels, freight car, 33 in. (per wheel)	48.500	Bars, C.F., carbon	8.174	Pipe line (100 ft)	146.804	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.675	Bars, C.F., alloy	11.285	Casing, oil well, carbon (100 ft)	154.216	Bale ties (bundle)	5.860
Structural Shapes	4.517	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	227.875	Nails, wire, 8d common	7.815
Bars, tool steel, carbon (lb)	0.430	Sheets, H.R., carbon	4.880	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	7.109
Bars, tool steel, alloy, oil hardening die (lb)	0.525	Sheets, C.R., carbon	5.871	Tubing, mechanical, carbon	‡	Woven wire fence (20-rod roll)	16.815
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Sheets, galvanized	7.140	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡ Not available.	
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.350				
		Strip, C.R., carbon	7.507				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Aug. 10 1954	Aug. 3 1954	Month Ago	July Average
(1947-1949=100)	144.5	144.5	144.6	144.6

STEEL's FINISHED STEEL PRICE INDEX*

	Aug. 11 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.19	194.19	194.19	189.38	152.90
Index in cents per lb.	5.261	5.261	5.261	5.130	4.142

STEEL's ARITHMETICAL PRICE COMPOSITES

	Aug. 4 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$117.77	$117.64	$117.39	$115.56	$91.92
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.07
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	28.50	28.50	27.67	44.17	20.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.
†Revised

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Aug. 11 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., del. Philadelphia	4.55	4.55	4.55	5.302	3.816
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, del., Philadelphia	4.53	4.53	4.53	4.38	3.492
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.025	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45-5.95	4.275
Strip, C.R., Chicago	6.00	6.00	6.00	5.70	4.00
Strip, C.R., Detroit	5.60-5.90	5.60-5.90	5.60-5.90	5.45-6.05	4.20
Wire, Basic, Pitts.	5.75	5.75	5.75	5.475-5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.35-6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.675	4.675	4.675	4.525	3.40

PIG IRON, Gross Ton	Aug. 11 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	60.75	49.39
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, del. Phila.	50.16	60.16	60.16	61.25	49.89
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	60.43	45.43
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$29.50	$29.50	$28.50	$44.50	$21.00
No. 1 Heavy Melt, E. Pa.	26.00	26.00	24.00	43.50	17.50
No. 1 Heavy Melt, Chicago	30.00	30.00	30.50	43.50	21.50
No. 1 Heavy Melt, Valley	29.50	29.50	26.50	45.50	19.50
No. 1 Heavy Melt, Cleve.	28.00	27.50	24.50	44.50	15.75
No. 1 Heavy Melt, Buffalo	26.50	26.50	25.50	43.75	24.25
Rails, Rerolling, Chicago	44.50	44.50	42.50	57.50	34.50
No. 1 Cast, Chicago	35.50	35.50	36.00	42.00	34.00

COKE, Net Ton

Beehive, Furn, Connisvl.	$14.75	$14.75	$14.75	$14.75	$13.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 27.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.00 del. Midwest; Lake 30.00 del; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 13.80, chemical 13.90, corroding 13.90, St. Louis; N.Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $285-$290, nom., per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices

DAILY NONFERROUS PRICE RECORD

	Price Aug. 11	Last Change	Previous Price	July Avg.	June Avg.	Aug. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	30.000	29.375
Lead	13.80	June 15	14.05	13.800	13.906	13.800
Zinc	11.00	June 3	10.50	11.000	10.923	11.000
Tin	93.75	Aug. 11	93.375	96.562	94.178	80.530
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	21.500	21.500	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium. $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 93.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb, f.o.b. shipping point; less than 1000 lb $5.10; 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.00, brass special 11.25, intermediate 11.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.35, special high grade 12.50, die casting alloy ingot 15.00, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingots: Piston Alloy 20.50-21.00; No. 12 foundry alloy (No. 2 grade) 19.50-20.00; 5% silicon alloy, 0.60 Cu max., 23.00-23.25; 13 alloy, 0.60 Cu max., 23.00-23.25; 195 alloy 21.25-22.25; 108 alloy 20.25-20.75; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.00-21.50; grade 2, 20.00-20.50; grade 3, 19.00-19.50; grade 4, 18.00-18.50.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze No. 225, 39.00; No. 245, 33.25; high-leaded tin bronze, No. 305, 31.50; No. 1 yellow, No. 405, 23.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $19.00 per cwt; pipe, full coils $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C. R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R. ...	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ...	84.5	66.5	90.5
Rod, Shapes ...	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks		60.0	...

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	34.7	38.9
50S-F	34.7	38.9
4S-F	35.7	40.6
52S-F	37.4	42.4
61S-T6	38.6	43.0
24S-T4*	40.8	46.9
75S-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom pipe size, in.	
⅜	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in., 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	...	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.3S	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44 41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.82	48.92	18.250	18.000	17.500
Commercial Bronze, 90%....	46.95	46.89	47 49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	53.36	50.43g	57.69	...	23.625	23.375	11.813
Phosphor Bronze, A, 5% ...	66.58	67.06	67.06	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Munts Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 13.00; low copper clippings 13.00; mixed clippings 11.00; old sheet 10.00; borings and turnings 6.00; pistons and struts 7.50; crankcases 10.00; industrial castings 10.00.

Copper and Brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 copper 23.00-23.25; light copper 21.00-21.25; No. 1 composition red brass 19.00-19.50; No. 1 composition turnings 18.50-19.00; mixed brass turnings 11.50-12.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 11.50-12.00; heavy yellow brass 14.00; new brass rod ends 16.00; auto radiators, unsweated 15.00; cocks and faucets 16.00-16.50; brass pipe 16.50-17.00.

Lead: Heavy 11.00-11.25; battery plate 5.75-6.00; linotype and stereotype 13.00; electrotype 11.50; mixed babbitt 12.00-12.50.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00, rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 4.75-5.00; new die cast scrap, 4.50-4.75; old die cast scrap, 3.00-3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.50-15.75; 51S, 52S clippings 15.25-15.75; 14S, 17S, 24S clippings 14.50-14.75; mixed clippings 14.00-14.50, old sheet 13.00-13.50; old cast 13.00-13.50; clean old cable, free of steel 15.00-15.75; borings and turnings 13.25-13.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper Brass: No. 1 copper 27.00; No. 2 copper 25.50; light copper 24.00; refinery brass (60% copper) per dry copper content 23.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 26.75-27.00; No. 2 copper 25.00-25.25; light copper 23.50-23.75; No. 1 composition borings 20.50; No. 1 composition solids 21.00-21.50; heavy yellow brass solids 17.00; yellow brass turnings 16.00; radiators 17.75-18.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.115; 200-499 lb $1.10; 500-999 lb $1.095; 1000 lb or more $1.09.

Zinc: Bar 18.50, bar or flat top 17.50 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.225.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71; 100-600 lb 56.7; 700-1900 lb 54.3; 2000-9900 lb 52.5; 10,000 lb or more 51.4.

Stannous Chloride: (Anhydrous): Less than 50 lb $1.57; 50 lb $1.23; 100-300 lb $1.08; 400-900 lb $1.055; 100-1900 lb $1.031; 2000-4900 lb 99.4; 5000-19,000 lb 99.3; 20,000 lb and over 87.2.

Stannous Sulphate: Less than 5 lb $1.269; 50 lb 96.9; 100-1900 lb 94.9; 2000 lb and over 92.9.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Is the sheen off the aluminum business? There's evidence it is, but it's apparent that any slowdown in aluminum use will be only temporary

HAS ALUMINUM consumption finally hit the saturation point after a dramatic 15-year growth splurge?

There's evidence some of the momentum may be fading and that now is the time to consolidate gains. Also apparent, from plans of bellwether companies in the industry, is the belief that any slowdown in aluminum use will be a temporary condition.

Spreading the Gospel — Certainly the price boosts now going into effect won't help the aluminum cause. Sellers of competing materials are openly enjoying the aluminum industry's discomfiture at raising prices.

For years part of the aluminum gospel has centered on the metal's steady or ever-decreasing price. Actually it isn't so. Aluminum has no distinction one way or the other since the war. Strangely enough its percentage changes compare favorably with copper. In relation to 1947 price averages, aluminum is now 36.6 per cent higher, copper 41 per cent higher. This compares with a 66 per cent rise in basic pig iron, 71 per cent in nickel, 20 per cent in tin and a 5-per-cent rise in lead and zinc.

The New Look — Cost estimators are working overtime these days computing new price schedules on mill products, following establishment of uniform prices on primary metal of 20.50 cents a pound for 99-per-cent-plus pigs and 22.20 for ingots. Kaiser Aluminum & Chemical Corp. estimates its sheet and plate increases will average 2.5 to 3 per cent and isn't raising the ante on aluminum shade screening which is being pushed strongly these days.

Kaiser beat other producers in announcing price increases of 3.5 to 5 per cent, effective Aug. 10, on rod, bar, wire, extrusions, welded tubing, foil and bare electrical conductor. Weatherproof aluminum conductor and some grades of cable were unchanged.

Aluminum Co. of America's price sheets show a 1.2-cent increase in 2S and 3S plate base, 1.5-cent increase on plate circle. Sheets and circles of these alloys are 1 to 1.3 cents higher. Alclad 3S plates and circles were raised 1.2 and 1.5 cents, respectively. Alclad 14S plate base and circles cost 1.5 cents a pound more, while sheet is up as much as 1.8 cents.

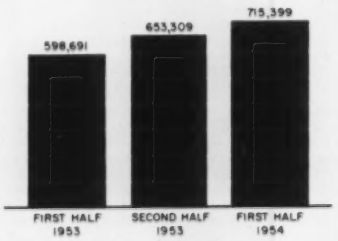
Effect of the price rise on sales isn't yet apparent because of anticipatory buying. But it will be watched closely: Increases ranging from $24 to $36 a ton can't be passed on lightly by fabricators.

Vacations Hit Zinc

Vacations in zinc fabricators' plants caused a sharp dip in shipment of smelter output during July. Continued stockpile buying by the government more than offset it though, and the industry managed to reduce stocks at month end to 197,885 tons. It's the first time since February that stocks have slipped below the 200,000-ton mark. If smelter production needs curtailment, and there's still considerable opinion in the industry that that's the only true solution to zinc's ills, no one seems to be taking the initiative. Production was off only slightly at 70,647 tons, as compared to domestic shipments of 59,197. Order backlog rested at 38,719 tons, and sellers are counting on the government siphoning off about 15,000 tons monthly for some time. Government account took 13,214 tons in July.

climbing

Primary Aluminum Output (net tons)



Source: U. S. Bureau of Mines.

Copper's Plentiful, They Say

"It is high time that the erroneous idea that copper will be in short supply for many years to come is set straight," scolds the Copper & Brass Research Association in its quarterly bulletin. "Various experts have been predicting that copper will be scarce during the balance of our lifetime or that copper reserves will be exhausted in 25 years. These predictions have been coupled with official exhortations to find substitutes for copper and its alloys." Not so, says the association. Pointing out that every major copper producer is currently developing new ore bodies and expanding present facilities for producing the red metal, it notes that when present expansion projects are completed in 1956, the nation's annual copper supply will be at least 300,000 tons higher, a 25-per-cent increase. Another factor overlooked, says Cabra, "is that as the annual consumption of copper increases, the recovery of copper scrap will also increase, adding substantially to the available supply."

Market Memos

- Aluminum sales officials have predicted a better second half than first, and June statistics may be first concrete evidence of pickup. Shipments of nearly all products were above May levels. Only rod and bar, bare cable and ACSR and die castings shipments were off.

- Eagle-Picher Co. has bought a lead-zinc mine in Shullsburg, Wis., from Calumet & Hecla Inc. The property has been producing since 1951 at a rate of about 1200 tons of concentrates per month.

- West Virginians claim Kaiser Aluminum & Chemical Corp. will build two fabricating plants costing about $68 million on the Ohio river in their state. Welded tubing will be produced in one of the plants.

- Tin's in a tailspin again. Prices last week were most active in a month, but consumers displayed little interest in bargains.

- Smelters of secondary aluminum raised ingot prices a half-cent last week on the heels of primary aluminum's advance.

- Watch for politics and metals to become an issue in the fall campaign. Grumbling over the government spending money to stabilize tin and copper prices and to bail out the zinc and lead industries is already increasing.

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for urgent military and
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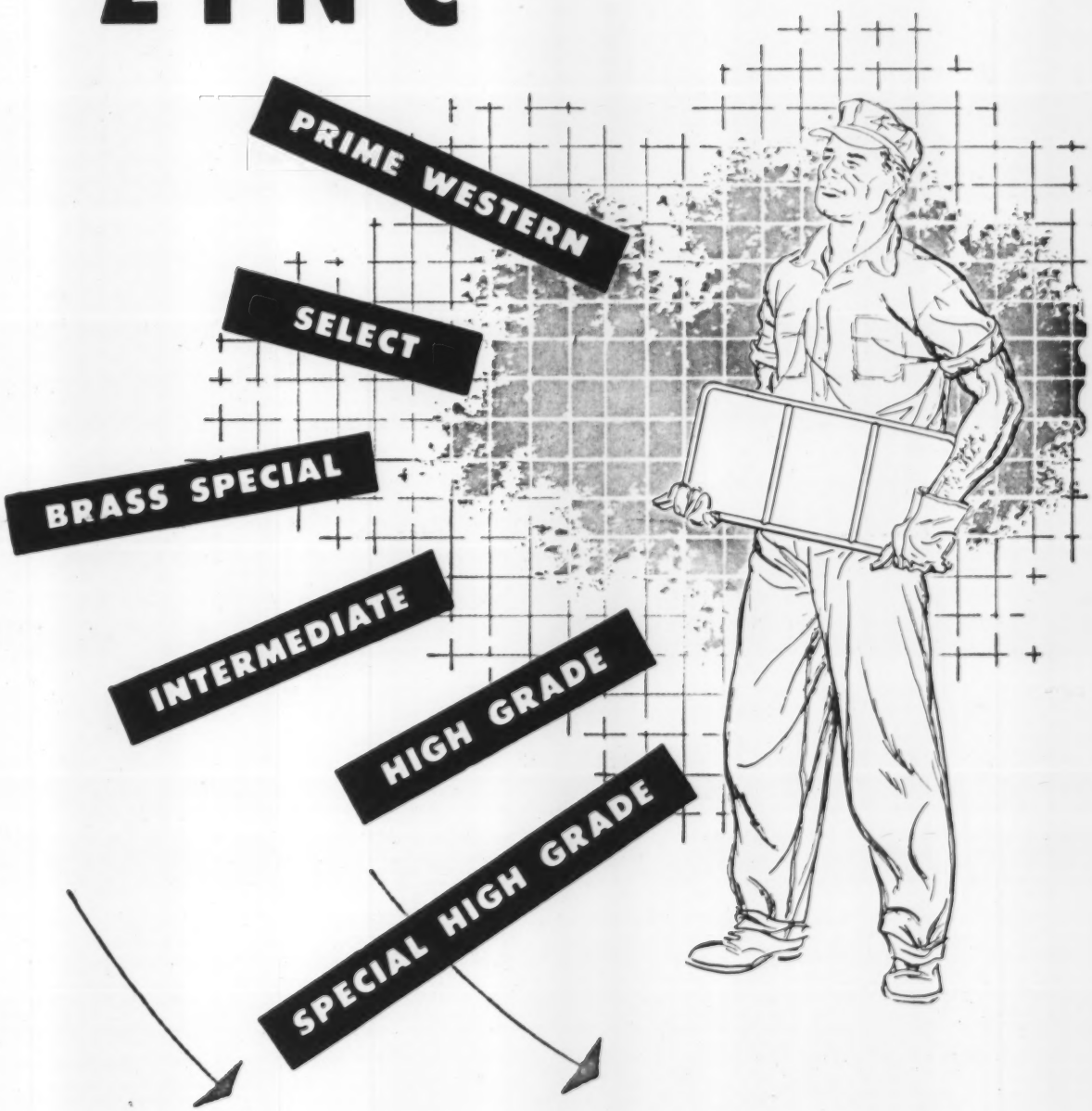

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 145. Key to footnotes, page 147.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$61.50

INGOTS, Alloy (NT)
Detroit R7 ....*$66.00*
Midland,Pa. C18 ....65.00
Munhall,Pa. U5 ....65.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 ....64.00
Clairton,Pa. U5 ....64.00
Ensley,Ala. T2 ....64.00
Fairfield,Ala. T2 ....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 ....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2 ..64.00
Munhall,Pa. U5 ....64.00
So.Chicago,Ill. U5 ....64.00
So.Duquesne,Pa. U5 ..64.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 ....78.00
Buffalo R2 ....78.00
Clairton,Pa. U5 ....78.00
Cleveland R2 ....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 ....78.00
Fairfield,Ala. T2 ....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 ....78.00
Geneva,Utah C11 ....78.00
Houston S5 ....85.50
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 ....87.50
Munhall,Pa. U5 ....78.00
Seattle B3 ....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ..78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$86.00
Buffalo R2 ....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 ....88.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 ....86.00
Houston S5 ....93.00
Ind.Harbor,Ind. Y1 ..86.00
Johnstown,Pa. B2 ....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 ....106.00
Massillon,O. R2 ....86.00
Midland,Pa. C18 ....86.00
Munhall,Pa. U5 ....86.00
So.Chicago R2,U5,W14..86.00
So.Duquesne,Pa. U5 ..86.00
Struthers,O. Y1 ....86.00
Warren,O. C17 ....86.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$96.50
Canton,O. R2 ....96.50
Cleveland R2 ....96.50
Gary,Ind. U5 ....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP
Aliquippa,Pa. J5 ....4.00
Fontana,Calif. K1 ....4.775
Munhall,Pa. U5 ....3.90
Warren,O. R2 ....3.90
Youngstown R2, U5 ....3.90

WIRE RODS
AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 ....4.675
Alton,Ill. L1 ....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 ....4.675
Donora,Pa. A7 ....4.675
Fairfield,Ala. T2 ....4.675
Fontana,Calif. K1 ....5.475
Houston S5 ....5.075
IndianaHarbor,Ind. Y1 4.675
Johnstown,Pa. B2 ....4.675
Joliet,Ill. A7 ....4.675
KansasCity,Mo. S5 ....5.015
Kokomo,Ind. C16 ....4.775
LosAngeles B3 ....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 ....4.675
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ..5.325
Portsmouth P12 ....4.675
Roebling,N.J. R5 ....4.775
So.Chicago,Ill. R2 ....4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 ....4.775
Struthers,O. Y1 ....4.675
SparrowsPoint,Md. B2..4.775
Torrance,Calif. C11 ..5.475
Worcester,Mass. A7 ..4.975

STRUCTURALS

Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 ....4.25
Bessemer,Ala. T2 ....4.25
Bethlehem,Pa. B2 ....4.30
Birmingham C15 ....4.25
Clairton,Pa. U5 ....4.25
Fairfield,Ala. T2 ....4.25
Fontana,Calif. K1 ....4.90
Gadsden,Ala.(31) R2 ..4.28
Gary,Ind. U5 ....4.25
Geneva,Utah C11 ....4.25
Houston S5 ....4.65
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 ....4.25
Niles,Calif. P1 ....4.80
Phoenixville,Pa. P4 ....3.95
Seattle B3 ....5.00
So.Chicago U5, W14....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange
Bethlehem,Pa. B2 ....4.30
Clairton,Pa. U5 ....4.25
Fontana,Calif. K1 ....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 ....4.25
Phoenixville,Pa. P4 ....*3.95*
So.Chicago,Ill. U5 ....4.25

Alloy Stand. Shapes
Clairton,Pa. U5 ....5.20
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.20
Munhall,Pa. U5 ....5.20
So.Chicago,Ill. U5 ....5.20

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ....6.40
Bessemer,Ala. T2 ....6.40
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.40
Fairfield,Ala. T2 ....6.40
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 ....6.40
Geneva,Utah C11 ....6.40
Ind.Harbor,Ind. I-2, Y1..6.40
Johnstown,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.10
Munhall,Pa. U5 ....6.40
Seattle B3 ....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 ....6.40

H.S., L. A. Wide Flange
Bethlehem,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 ....6.40
So.Chicago,Ill. U5 ....6.40

PILING

Bearing Piles
Munhall,Pa. U5 ....4.25
So.Chicago,Ill. U5 ....4.25

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..5.075
Lackawanna,N.Y. B2..5.075
Munhall,Pa. U5 ....5.075
So.Chicago,Ill. U5 ....5.075

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2..4.255
Aliquippa,Pa. J5 ....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 ....4.225
Buffalo(31) R2 ....4.255
Clairton,Pa. U5 ....4.225
Claymont,Del. C22 ....4.225
Chicago(31) R2 ....4.295
Cleveland J5 ....4.225
Cleveland(31) R2 ....4.285
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 ....4.375
Fairfield,Ala. T2 ....4.225
Gadsden,Ala.(31) R2 ..4.255
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 ....4.225
Geneva,Utah C11 ....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....*3.975*
Houston S5 ....4.625
Ind.Harbor,Ind. I-2, Y1 4.225
Johnstown,Pa. B2 ....4.225
Lackawanna,N.Y. B2..4.225
LoneStar,Tex. L6 ....4.40
Mansfield,O. E6 ....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 ....4.225
Newport,Ky. N9 ....4.225
Pittsburgh J5 ....4.225
Riverdale,Ill. A1 ....4.225
Seattle B3 ....5.125
Sharon,Pa. S3 ....4.225
So.Chicago,Ill. R2 ....4.295
So.Chicago,Ill. U5,W14 4.225
SparrowsPoint,Md. B2 ..4.225
Steubenville,O. W10 ...4.225
Warren,O.(31) R2 ....4.265
Weirton,W.Va. W6 ....4.225
Youngstown(31) R2 ..4.275
Youngstown U5, Y1 ..4.225

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....6.025
Geneva,Utah C11 ....5.375

PLATES, Wrought Iron
Economy,Pa. B14 ....9.80

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland J5, R2 ....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 ....6.60
Fairfield,Ala. T2 ....6.45
Fontana,Calif.(30) K1..7.15
Gary,Ind. U5 ....6.45
Geneva,Utah C11 ....6.45
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.35
Munhall,Pa. U5 ....6.45
Pittsburgh J5 ....6.45
Seattle B3 ....7.35
Sharon,Pa. S3 ....6.45
So.Chicago,Ill. U5, W14..6.45
SparrowsPoint,Md. B2 ..6.45
Warren,O. R2 ....6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy
Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 ....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 ....5.80
Johnstown,Pa. B2 ....5.80
Munhall,Pa. U5 ....5.80
Newport,Ky. N9 ....5.80
Seattle B3 ....6.70
Sharon,Pa. S3 ....5.80
So.Chicago,Ill. U5, W14..5.80
SparrowsPoint,Md. B2 ..5.80

FLOOR PLATES
Cleveland J5 ....5.275
Conshohocken,Pa. A3..5.275
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ..5.275
Munhall,Pa. U5 ....5.275
So.Chicago,Ill. U5 ....5.275

PLATES, Ingot Iron
Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 ....4.825
Warren,O. c.l. R2 ....4.825

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 ....4.30
Alton,Ill. L1 ....4.50
Atlanta,Ga. A11 ....4.50
Bessemer,Ala. T2 ....4.30
Birmingham C15 ....4.30
Buffalo(31) R2 ....4.33
Canton,O.(31) R2 ....4.46
Chicago(31) R2 ....4.37
Clairton,Pa. U5 ....4.30
Cleveland(31) R2 ....4.36
Ecorse,Mich. G5 ....4.45
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 ....4.30
Fairless,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Gary,Ind. U5 ....4.30
Gadsden,Ala.(31) R2 ..4.33
Houston S5 ....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
LosAngeles B3 ....5.00
Massillon,O.(31) R2 ..4.46
Milton,Pa. M18 ....4.30
Minnequa,Colo. C10 ...4.75
Niles,Calif. P1 ....4.85
N.Tonawanda,N.Y. B11.4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
Seattle B3, N14, P23 ..5.05
So.Chicago U5, W14 ..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ....4.40
Struthers,O. Y1 ....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 ....4.34
Weirton,W.Va. W6 ....4.30
Youngstown U5 ....4.30
Youngstown(31) R2 ....4.35

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....5.075
Buffalo R2 ....5.105
Canton,O. T7 ....*5.075*
Canton,O. R2 ....5.115
Chicago R2 ....5.145
Clairton,Pa. U5 ....5.075
Detroit R7 ....5.175
Ecorse,Mich. G5 ....5.225
Fontana,Calif. K1 ....6.125
Fairless,Pa. U5 ....5.225
Gary,Ind. U5 ....5.075
Houston S5 ....5.475
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 ....6.125
Massillon,O. R2 ....5.115
Midland,Pa. C18 ....5.075
So.Chicago U5, W14 ..5.075
So.Duquesne,Pa. U5 ..5.075
Struthers,O. Y1 ....5.075
Warren,O. C17 ....5.075
Youngstown U5 ....5.075

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland R2 ....6.45
Ecorse,Mich. G5 ....6.60
Fairfield,Ala. T2 ....6.45
Fontana,Calif. K1 ....7.70
Gary,Ind. U5 ....6.45
Ind.Harb.,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.35
Pittsburgh J5 ....6.45
Seattle B3 ....7.20
So.Chicago W14 ....6.45
So.Duquesne,Pa. U5 ..6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 ....6.45
Youngstown U5 ....6.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ....4.45

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....4.30
Atlanta A11 ....4.50
Fontana,Calif. K1 ....5.00
Niles,Calif. P1 ....4.85
SanFrancisco S7 ....4.70

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ....5.20
Gary,Ind. U5 ....5.20
Houston S5 ....5.60
KansasCity S5 ....5.80
Youngstown U5 ....5.20

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
BeaverFalls,Pa. R2 ....5.46
Camden,N.J. P13 ....5.85
Carnegie,Pa. C12 ....5.40
Chicago W18 ....5.40
Cleveland A7, C20 ....5.40
Detroit R7 ....*5.55*
Detroit B5, P17 ....5.60
Donora,Pa. A7 ....5.40
Elyria,O. W8 ....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. R2 ....5.47
GreenBay,Wis. F7 ....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 ....5.90
Harvey,Ill. B5 ....5.40
LosAngeles R2, S30 ...6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R8 ....5.40
Massillon,O. R2 ....5.44
Monaca,Pa. S17 ....5.40
Newark,N.J. W18 ....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 ....5.40
Plymouth,Mich. P5 ....*5.65*
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
St.Louis,Mo. M5 ....5.70
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 ....5.85
Struthers,O. Y1 ....5.40
Waukegan,Ill. A7 ....5.40
Worcester,Mass. W19 ..*5.85*
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Alloy
(Turned and Ground)
Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12 ..6.625
BeaverFalls,Pa. R2 ..6.685
Bethlehem,Pa. B2 ....6.625
Buffalo B5 ....6.625
Camden,N.J. P13 ....6.80
Canton,O. T7 ....*6.625*
Carnegie,Pa. C12 ....6.625
Chicago W18 ....6.325
Cleveland A7, C20 ....6.625
Detroit R7 ....*6.725*
Detroit P17 ....*6.825*
Detroit B5 ....6.825
Donora,Pa. A7 ....6.625
Elyria,O. W8 ....6.625
Gary,Ind. R2 ....6.695
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 ....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 ....8.30
Mansfield,Mass. B5 ..7.075
Massillon,O. R8 ....6.625
Massillon,O. R2 ....6.665
Midland,Pa. C18 ....6.625
Monaca,Pa. S17 ....6.625
Newark,N.J. W18 ....6.80
Plymouth,Mich. P5 ....*6.825*
So.Chicago W14 ....6.625
SpringCity,Pa. K3 ....6.80
Struthers,O. Y1 ....6.625
Warren,O. C17 ....6.625
Waukegan,Ill. A7 ....6.625
Worcester,Mass. A7 ..6.925
Youngstown F3, Y1 ....6.625

BARS, Reinforcing (fabricators)
Atlanta A11 ....4.50
Birmingham C15 ....4.30
Buffalo(31) R2 ....4.33
Chicago(31) R2 ....4.37
Cleveland(31) R2 ....4.36
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 ....4.30
Fairless,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Ft.Worth,Tex.(42) 4.90
Gadsden,Ala.(31) R2 ..4.33
Gary,Ind. U5 ....4.30
Houston S5 ....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ....5.00
Milton,Pa. M18 ....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 ....4.85
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 ....4.30
SandSprings,Okla. S5 ..5.15
Seattle B3, N14, P23..5.05
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ....4.40
Struthers,O. Y1 ....4.30
Torrance,Calif. C11 ....5.00
Youngstown U5 ....4.30
Youngstown(31) R2 ....4.35

BARS, Reinforcing
(Fabricated; to consumers)
Johnstown, ¼-1" B2 ..5.70
KansasCity S5 ....6.35
LosAngeles B3 ....5.95
Marion,O. P11 ....5.55
Seattle N14, P23 ....5.95
Seattle B3 ....6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ½-1" B2 ..5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS
Avis,Pa.(3) J8 ....4.25
ChicagoHts.(3) C2, I-2.4.20
ChicagoHts.(4) C2, I-2.4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa.(3) F5 ....4.05
Franklin,Pa.(4) F5 ....4.15
Marion,O(3) P11 ....4.15
Moline,Ill (3) R2 ....4.30
Tonawanda(3,4) B12 ..4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 ..10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..4.05
Allenport,Pa. P7 ....4.05
Ashland,Ky.(8) A10 ....4.05
Cleveland J5, R2 ....4.05
Conshohocken,Pa. A3 ..4.10
Detroit(8) M1 ....*4.20*
Ecorse,Mich. G5 ....4.20
Fairfield,Ala. T2 ....4.05
Fairless,Pa. U5 ....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 ....4.05
Geneva,Utah C11 ....4.15
GraniteCity,Ill. G4 ....4.25
Ind.Harbor,Ind. I-2, Y1 4.05
Irvin,Pa. U5 ....4.05

Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ..4.05
Mansfield,O. E6 (38) ..4.80
Munhall,Pa. U5 .....4.05
Newport,Ky N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.06
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ...4.05
SparrowsPoint,Md. B2..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)
AlabamaCity,Ala. R2 ..5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.10
Fairless,Pa. U5 .....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1 6.10
Irvin,Pa. U5 .....6.10
Lackawanna(35) B2 .....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.30
Cleveland R2 .....4.65
Cleveland J5 .....4.775
Ind.Harbor,Ind. I-2 ...4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)
Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....4.95
Fairless,Pa. U5 .....5.00
Follansbee,W.Va. F4 ..4.95
Fontana,Calif. K1 ....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1 4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ..4.95
Middletown,O. A10 ....4.95
Pittsburg,Calif. C11 ...5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 ....4.95
SparrowsPoint,Md. B2 ..4.95
Steubenville,O. W10 ....4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.65
Fairless,Pa. U5 .....7.55
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1..7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ..7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.55
Middletown,O. A10 ....6.45
Warren,O. R2 .....5.55

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Fairfield T2	6.25	6.50
Gary,Ind. U5	6.25	6.50
Ind.Harbor I-2	6.25	6.50
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.35	....
MartinsFry.,O. W10	6.25	....
Newport,Ky. N9	6.25	6.50
Pitts.,Calif. C11	7.00	....
SparrowsPt. B2	6.25	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.75
Fairfield,Ala. T2	6.50
MartinsFerry,O. W10	6.50

SHEETS, Galvanized Steel
Hot-dipped
AlabamaCity,Ala. R2 ..5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 .....5.45*
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Irvin,Pa. U5 .....5.45†
Kokomo,Ind. C16.....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45†
Niles O N12 .....5.45‡
Pittsburg,Calif. C11 ..6.20‡
SparrowsPt.,Md. B2 ..5.45‡
Steubenville,O. W10 ..5.275‡
Weirton,W.Va. W6 ...5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous

SHEETS, Galvanized
High-Strength Low-Alloy
Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvanized Ingot Iron
Ashland,Ky.(8) A10 ...5.70
Canton,O. R2 .....6.20

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.85
Irvin,Pa. U5 .....*5.85*
Kokomo,Ind. C16 .....5.95†
Newport,Ky. N9 .....6.00
Niles,O. N12 .....6.00

SHEETS, Galvanized
Ingot Iron
(Hot-dipped continuous)
Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.30
Niles,O. R2 (28) 6.30
Weirton,W.Va. W6 ....5.975

SHEETS, Aluminum Coated
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ..5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

SLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 ....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)
BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ...6.25

SHEETS, Well Casing
Fontana,Calif. K1 ....6.325

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ...4.05
Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn.(10)S15 4.05
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3..4.175
Detroit M1 .....*4.20*
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Houston,Tex. S5 .....4.45
Ind.Harbor,Ind. I-2, Y1 4.05
Johnstown,Pa.(25) B2..4.05
KansasCity,Mo.(9) S5 ..4.65
Lackw'na,N.Y.(25) B2..4.05
LosAngeles(25) B3 ....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 ....5.15
NewBritain(10) S15 ....4.05
N.Tonawanda,N.Y. B11 4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ...5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2...4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5 .....4.05

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 ....8.10
Gary,Ind. U5 .....6.70
Houston,Tex. S5 .....7.10
KansasCity,Mo. S5 .....7.30
LosAngeles B3 .....7.90
NewBritn.,Conn.(10)S15 6.45
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5 .....6.70

STRIP, Hot-Rolled
High-Strength Low-Alloy
Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ..5.95
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Ind.Harbor,Ind. I-2, Y1 6.15
Lackawanna,N.Y. B2 ..6.15
LosAngeles(25) B3 .....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 ....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ...4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon
Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Bridgeport,Conn.(10)S15 5.75
Cleveland A7, J5 .....5.75
Dearborn Mich. D3 ....5.90
Detroit D2, M1 .....*5.90*
Detroit P20 .....*5.95*
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.90
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 ....7.65
FranklinPark,Ill. T6 ...5.85
Ind.Harbor,Ind. I-2 ...6.00
Indianapolis C8 .....5.90
Lackawanna,N.Y. B2 ...5.75
LosAngeles C1 .....7.80
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ...5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ...6.50
NewHaven,Conn. D2 ...6.20
Pawtucket,R.I. R3 ....6.40
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 .....5.75
Sharon,Pa. S3 .....5.75
SparrowsPt.,Md. B2 ...5.75
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ...6.20
Warren,O. B9 .....5.45
Warren,O. R2, T5 .....5.75
Weirton,W.Va. W6 ....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 ....14.55
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 ....12.45
Mattapan,Mass. T6 ...12.80
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ...12.75
Youngstown C8 .....12.90

STRIP, Cold-Rolled
High-Strength Low-Alloy
Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.75
Dover,O. G6 .....8.60
Ecorse,Mich. G5 .....8.75
Lackawanna,N.Y. B2..8.425
Pittsburgh J5 .....8.60
Sharon,Pa. S3 .....8.60
SparrowsPoint,Md. B2..8.425
Warren,O. R2 .....8.60
Weirton,W.Va. W6 ....8.60
Youngstown Y1 .....8.60

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.35

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.775
Riverdale,Ill. A1 .....4.625
Sharon,Pa. S3 .....4.475
Youngstown U5 .....4.475

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div., H. K. Porter Co. Inc.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron& Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.00	10.95	13.25
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	...	8.20	9.00	10.95	....
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	10.95	13.25
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pautucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	10.95	13.25
Weirton,W.Va. W6	5.85	8.05	9.00	10.95	13.25
Worcester,Mass. A7	6.60	8.35	9.30	11.45	14.15
Worcester,Mass. T6	6.30	8.35	9.30	11.45	14.15
Youngstown C8	...	8.05	9.00	10.95	13.25
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	12.85	15.35	18.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric Motor		Dynamo
BeechBottom,W.Va W10	...	...	9.10	10.10	11.00
Brackenridge,Pa. A4	...	...	9.10	10.10	11.00
IndianaHarbor,Ind. I-2	8.025	8.50	9.10	10.10	....
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	...	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	...	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric Motor		Dynamo
Brackenridge,Pa. A4	...	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	...	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225	9.25	9.85	10.85	11.75
Zanesville,O. A10	...	9.25	9.85	10.85	11.75

	Transformer Grade			
H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95	12.50	13.00	14.00
C.R. COILS & CUT LENGTHS	**T-100**	**T-90**	**T-80**	**T-73**	**T-72**
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.00	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. § Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
Warren,O. R2	6.50
SparrowsPoint,Md. B2	6.60
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.15
Jacksonville,Fla. M8	6.27
Joliet,Ill. A7	5.75
KansasCity, Mo. S5	6.35
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark, 6-8 ga. I-1	*6.40*
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	6.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE MB Spring, High Carbon	
Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFran. C10	8.15
SparrowsPt., Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7, J4, T6, W12	7.50

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving(8" Coils)	
Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	10.55
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.95
Monessen, Pa. P16	11.20
Muncie, Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. D2	*9.90*
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7	9.35
Monessen,Pa. P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	6.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
Kokomo,Ind. C16	7.55
FranklinPark,Ill T6	8.05
Massillon,O. R8	7.95
Monessen,Pa. P7, P16	7.95
Pawtkt.,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality (6 to 8 gage)	An'ld.	Galv.
Ala.City R2	6.90	7.30**
Aliquippa J5	6.90	7.425§
Atlanta A11	7.00	7.55
Bartonville(48) K4	7.00	7.55
Buffalo W12	6.90	7.30†
Cleveland A7	6.90	....
Crawfordsville M8	7.00	7.55
Donora,Pa. A7	6.90	7.30†
Duluth,Minn. A7	6.90	7.30†
Fairfield T2	6.90	7.30†
Houston,Tex. S5	7.30	7.70
Jacks'ville,Fla.M8	7.425	7.95
JohnstownB2(48)	6.90	7.45*
Joliet,Ill. A7	6.90	7.30†
KansasCity,Mo. S5	7.50	7.90
Kokomo C16	7.00	7.40†
LosAngeles B3	7.85	....
Minnequa C10	7.15	7.55**
Monessen P7 (48)	6.90	7.45
Palmer W12	7.20	7.60†
Pitts.,Calif. C11	7.85	8.25†
Portsmouth,O. P12	6.90	....
Rankin A7	6.90	7.30†
So.Chi'go R2	6.90	7.30**
S.S.Frn. C10	7.85	8.25**
Spar'wsPt.B2(48)	7.00	7.55*
Str'g(1)(48)N15	6.90	7.45
Struthers,O. Y1	6.90	7.40‡
Worcester A7	7.20	....

* Based on 11c zinc; † 5c zinc; ‡ Less than 10c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga	Col.
Ala.City,Ala.R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala T2	146†
Houston,Tex. S5	154
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	158
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	151
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

† Based on 5c zinc; * 11c zinc; § 10c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
KansasCity,Mo. S5	167
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed	Col.
AlabamaCity R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	167
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	171
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	163
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'ld.	Galv. Stone	Galv. Stone
Ala.City R2	13.15	14.70**	
Aliquippa J5	12.50	14.30§	
Bartonville K4	13.25	15.10	
Buffalo W12	13.15	....	
Cleveland A7	13.15	....	
CrawfordsvilleM8	13.25	15.10	
Fostoria,O. S1	13.25	14.80†	
Johnstown B2	13.15	15.00*	
Kokomo C16	12.60	14.15†	
Minnequa C10	13.40	15.10**	
Palmer,Mas.W12	13.15	14.70*	
Pitts.,Calif. C11	13.50	15.05†	
So.Chicago R2	13.15	14.70	
SparrowsPt. B2	13.25	15.10*	
Sterling(1) N15	13.15	15.00	
Waukegan A7	13.15	14.70†	
Worcester A7	13.45	....	

* Based on 11c zinc; † 5c zinc; § 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	145
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity, Mo. S5	149
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt., Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	138
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	140
Crawfordsville,Ind. M8	140
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	140
Minnequa,Colo. C10	143
Monessen,Pa. P7	138
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
So.Chicago,Ill. R2	138
SparrowsPt. Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	155
Moline,Ill. R2	150
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	*150*
Williamsport,Pa. S19	150

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	13.5	list	17.5	0.25	20	2.75	21.5	4.25	21.5	4.25	20.75	3.5	23.25	6
Ambridge, Pa. N2 (†)	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3 (*)	13.5	2.25	17.5	3.25	20	5.75	21.5	7.25	21.5	7.25	20.75	6.5	23.25	9
Youngstown Y1 (††)	13.5	+1.5	17.5	0.75	20	3.25	21.5	4.75	21.5	4.75	20.75	4	23.25	6.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	13.5	1.5	17.5	0.75	20	3.25	21.5	4.75	21.5	4.75	20.75	4	23.25	6.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	23.75	7.5	26.75	11.5	29.25	15	31.75	16	32.25	17
Alton, Ill. L1 (‖)	...	...	...	...	...	...	21.75	6.5	24.75	10.5	27.25	14	29.75	14.75	30.25	15.75
Benwood, W.Va. W10(††)	24	+2.5	15.25	+8.25	7.25	+14.25	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75	32.25	17.75
Butler, Pa. F6‡‡	25	+1.5	17	+6.5	9.5	+12	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (†)	...	...	...	...	...	...	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75	32.25	17.75
Fairless, Pa. N3	...	...	...	...	...	...	19.25	...	22.25	...	24.75	...	27.25	...	27.75	...
Fontana, Calif. K1 (‖)	...	...	...	...	...	...	10.75	+4.5	13.75	+0.5	16.25	3	18.75	3.75	19.25	4.75
Ind. Harbor Y1 (††)	...	...	...	...	...	...	22.75	7.5	25.75	11.5	28.25	15	30.75	15.75	31.25	16.75
Lorain, O. N3 (*)	...	...	...	...	...	...	23.75	13.5	26.75	17.5	29.25	21	31.75	20.5	32.25	21.5
Sharon, Pa. S4 (‡)	25	+1.5	17	+6.5	9.5	+12	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75	32.25	17.75
Sparrows Pt., Md. B2 (‖)	23	+3.5	15	+8.5	7.5	+14	31.75	6.5	24.75	10.5	27.25	13	29.75	14	30.25	16
Youngstown R2 (**)	...	...	...	...	...	...	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75	32.25	17.75
Youngstown Y1 (††)	...	...	...	...	...	...	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75	32.25	17.75
Wheatland, Pa. W9 (‖)	23	+3.5	15	+8.5	7.5	+14	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75	32.25	17.75

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.75	17.5	34.25	17.5	34.25	17.5	...	...	...	...
Alton, Ill. L1 (‖)	30.75	16.25	32.25	16	32.25	16	23.25	6.75	23.25	6.75
Benwood, W.Va. W10(††)	32.75	18.25	34.25	18	34.25	18	25.5	8.75	25.5	8.75
Etna, Pa. N2 (†)	32.75	18.25	34.25	19	34.25	19	25.5	8.75	25.5	8.75
Fairless, Pa. N3	28.25	...	29.75	...	29.75	...	21	...	21	...
Fontana, Calif. K1 (‖)	19.75	5.25	21.25	5	21.25	5	12.5	+4.25	12.5	+4.25
Ind. Harbor, Ind. Y1 (††)	31.75	17.25	33.25	17	33.25	17	...	...	...	...
Lorain, O. N3 (*)	32.75	22	34.25	20.5	34.25	20.5	...	...	...	...
Sharon, Pa. M6	32.75	18.25	34.25	18	34.25	18	...	...	...	...
Sparrows Pt., Md. B2 (‖)	29.75	15.5	32.25	15.5	32.25	15.5	23.5	6.25	23.5	6.25
Youngstown R2 (**)	32.75	18.25	34.25	18	34.25	18	25.5	8.75	25.5	8.75
Youngstown Y1 (††)	32.75	18.25	34.25	18	34.25	18	...	...	...	...
Wheatland, Pa. W9 (‡)	32.75	18.25	34.25	18	34.25	18	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (‖), over 9c to 11c inclusive; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment; (‡‡), 11c.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	....	5.35
Fairfield,Ala. T2	....	....	....	5.35
Gary,Ind. U5	4.45	4.35	4.40	....
Huntington,W.Va. W7	....	....	....	5.35
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	....
Johnstown,Pa. B2	....	....	...(16)	5.35
Lackawanna,N.Y. B2	4.45	4.35	....	5.35
Minnequa,Colo. C10	4.45	4.35	....	5.85
Steelton,Pa. B2	4.45	4.35	....	5.35
Williamsport,Pa. 819	....	....	....	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3	11.50
Pittsburgh P14	11.50
Seattle,Wash. B3	12.00

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great. Structural ½-in., larger 9.25; ⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ¾-in.	5
⅞-in. and larger	3
Longer than 6 in.:	
All diameters	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoes	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1¼", inclusive	60
1¼" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex regular & heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¾" to 1½", inclusive	40
⅞" to 1½", inclusive	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5—10
Plated finishes	30—10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	18.00
Unannealed	
Minus 100 mesh	14.50
Minus 35 mesh	10.25
Minus 20 mesh	10.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (8wedish), f.o.b. Riverton, N. J., in bags	11.25
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	32.00
Ton lots	34.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	28.75-37.50†
Bronze, ¼-ton lots	31.00-39.00†
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	45.75‡
Nickel-Silver, ¼-ton lots	48.50**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots	18.25-32.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) 5/16" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Reinforced.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S.-L.A.
(31) Base; deld. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

STAINLESS STEEL MILL PRICES

(Representative prices cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	49.00	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	53.25	55.50	59.00	62.75	62.75
316L	....	....	52.50	....	58.25	61.00	64.25	67.75	67.75
317	33.00	43.50	56.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	56.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	46.00	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co., Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.80	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; Copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.030
19	4	2	12	....	3.990
18.25	4.25	1	4.75	....	2.245-2.415
18	4	2	9	....	2.615
18	4	2	....	....	1.705
18	4	1	....	....	1.540
18	4	1	5	....	2.250
14	4	2	5	....	2.185
13.75	3.75	2	5	....	2.185
13.5	4	3	....	....	1.805
9	3.5	..	....	....	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.990

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Chester,Pa. C31	*48.00*	*48.50*	*49.00*	....
Philadelphia, del.	*49.66*	*50.16*	*50.66*	....
Steelton,Pa. H2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy, N. Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	*$65.00*
Buffalo H1	*66.25*

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	67.55
Troy,N.Y. R2	64.00

F&Y HELPS THE NATION'S STEEL MILLS

speed production with

PARALLOY

STEEL MILL ROLLS
PINCH ROLLS
COILER ROLLS
TENSION ROLLS

Other F&Y Products of Proven Performance

- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
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- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
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- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

Roll More Tons per Pass
No Scratching or Galling

500-600-BRINELL

Paralloy Rollers

F&Y

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

8

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham, St. Paul, 15 cents; Boston, Philadelphia, New York, 10 cents; Seattle and Spokane, Wash., no change; at Buffalo and Philadelphia, on cold-finished bars and sheets and alloy bars, 25 cents.)

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡§	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.◊	H.R. Alloy 4140††¶		Carbon	Floor
Baltimore	6.22	7.51	7.77	....	6.89	...	6.88	8.52[4]	12.04	6.92	6.57	7.96**
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.62	44.78[3]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.84	....	6.70	...	6.50	7.90	12.20	6.77	6.70	7.80
Carnegie, Pa.	6.38	...	8.30	....	6.72	...	6.51	7.85	12.15	6.72	6.65	6.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.48	7.37	8.25	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.35	7.35	8.75
Los Angeles	7.40	9.25	9.80	50.15	7.75	11.75	7.35	10.05	13.20	7.65	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	6.81	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[4]	10.53	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.13	8.09	41.98[3]	6.96	8.80	6.74	8.19[4]	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64**
Portland, Oreg.	7.60	8.75	9.70	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.03	8.03	8.96	....	7.28	...	7.16	8.26	....	7.12	7.19	8.30
San Francisco	7.55	8.95	9.35	48.15	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	8.30	...	7.80	10.85[3]	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed. ‡‡prices include $2 for crating; Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston where base is 10,000 lb. [2]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lbs; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

Warehouse Demand Slightly Improved

Some rush shipments sought as manufacturers resume operations following vacation shutdowns. General pickup in buying is expected during September

Cleveland—There has been some improvement in demand on local warehouses with resumption of manufacturing operations by plants that had been down for vacations, but the upturn in business is not particularly imposing. In fact, with vacation suspensions still a factor, the distributors do not anticipate much increase in volume this month as compared with that entertained in July.

Pittsburgh—The sales trend is encouraging, backed up by an improving rate of small orders. Most of these are for rush shipments showing that most fabricators have worked off inventory accumulation. Summer volume has not been as far below spring business as was the case in earlier peacetime years, most distributors say.

Chicago—Warehouse steel sales are on a lower plane than had been anticipated but still they are running more consistently than is mill order volume.

Philadelphia—Warehouses handling diversified products note little change in business conditions from those prevailing in July, which was the slowest month of the year to date. Demand so far in August, on a daily basis, has not varied more than 2 to 3 per cent one way or the other, according to one leading distributor.

Boston — Incoming orders show slight, if any, improvement over those received in July. Distributors handling galvannealed sheets are adjusting prices to a $3 per ton reduction in mill quotations. Demand for highway and bridge steel specialties is relatively active but some price shading is reported.

San Francisco—A pickup in orders which occurred in June has not carried through July because of vacations by manufacturing customers.

Cincinnati — Warehouse customers are seeking quick service. Mills are taking some orders that formerly

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.95	$4.95	$4.85	$5.23
Bar Size Angles	4.65	4.65	4.55	4.93
Structural Angles	4.65	4.65	4.55	4.93
I-Beams	4.50	4.50	4.40	4.73
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire	7.30	7.30	7.30	7.63
Merchant Bars	5.00	5.00	5.00	5.33
Hot-Rolled Bands	5.15	5.15	5.10	5.43
Wire Rods, Thomas Commercial No. 5	4.80	4.87	4.85	5.12
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Sizes OD				
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

went to warehouses, 1000 pound orders in some cases. Vacations and plant layoffs do not make the distributors' picture any brighter.

Los Angeles—Distributors report August activity 15 to 20 per cent below that of June and July.

Portland — Local warehouses are feeling the effects of the protracted strike of loggers and mill crews. Warehousemen estimate the current labor dispute has reduced their volume about 20 per cent.

Sheets, Strip . . .

Sheet and Strip Prices, Page 144 & 145

Pittsburgh — Slowdowns at automakers plants are having an adverse effect on cold-finished sheet shipments. Production and orders are below second quarter levels, but an upturn should begin late in August.

U. S. Steel Corp. lowered the price of galvannealed sheet from 6.00 cents per pound to 5.85c Aug. 5, at the corporation's Irvin, Pa., Works.

Boston—When heavier orders for sheets and strip are forthcoming, probably for October delivery, volume will closely approximate actual requirements to cover booked needs.

Some earlier price-hedge orders have been deferred to September-October.

New York—It is still much the same story with respect to hot and cold-rolled sheets. Inquiry continues to lag and deliveries can be had within two to three weeks on hot sheets and three to four weeks on cold sheets, especially by shopping a bit.

Philadelphia—Most sheet mills can make shipments on hot-rolled sheets within three weeks or less and on cold-rolled within five weeks. Producers see little gain before September, at which time automotive requirements should be picking up as should some household durables.

Cleveland—Despite generally sluggish demand for sheets and strip there are a few bright spots in the market currently in this area. Producers report they are in receipt of a few requests from consumers seeking shipment of September tonnage in August. This is seen as reflecting depleted inventories.

Cincinnati — All grades of cold-finished sheets are moving slowly. Price weakness in seconds has spread to prime sheets among warehouses. In contrast, demand for hot-rolled sheets is steady and prices are firm.

Chicago—Significant improvement in demand for hot-rolled and cold-rolled sheets awaits release of specifications by automakers as new models go on assembly lines. Prospects indicate September pickup.

New pricing setup for slit sheets?

A MILL PRICING setup specifically for slit steel sheets may not be far away. Now, mills price them under strip pricing cards. Result: Some mills see business getting away from them. Logic and economics suggest that they will do something about it.

Anyone who needs light and narrow cold-rolled steel but who does not need special edge, temper or finish in that product is inclined to specify material slit from cold-rolled sheets rather than pay the higher price for strip that has been rolled as a single strand. Similarly, slit hot-rolled sheet may be specified in place of hot-rolled strip.

Three Avenues—Since mills do not sell slit sheet for less than strip prices, consumers who want slit sheet do one of three things: 1. Look for warehouses that will slit sheet and sell it for less than strip; 2. buy sheet and have a slitting service slit it; or 3. buy a slitter and do their own slitting.

Before the days of slitters, consumers had to take the product of a strip mill to get a narrow product. However, many consumers don't need the special edge, temper, finish or quality imparted by a cold strip mill. Now that they can get narrow material via slitters they're using it and holding down costs. Savings of from $20 to $40 a ton are reported.

Comparisons—The spread between the cost of cold-rolled carbon strip and cold-rolled carbon sheet from which material might be slit depends on the sizes, qualities and quantities ordered. For instance, coiled strip .075-inch thick and under 12 inches in width is $24 to $49 a ton more than coiled sheet of the same thickness and between 36 and 48 inches in width. That width range of sheet is the lowest priced in the .075 thickness. The $24 to $49 price spread depends on the width of strip specified.

Slit edge will suffice in around 85 per cent of the needs for narrow material, according to some of those studying the matter.

The slit edge steel under price study is in most cases material under 12 inches wide cut from sheets over 36 inches wide.

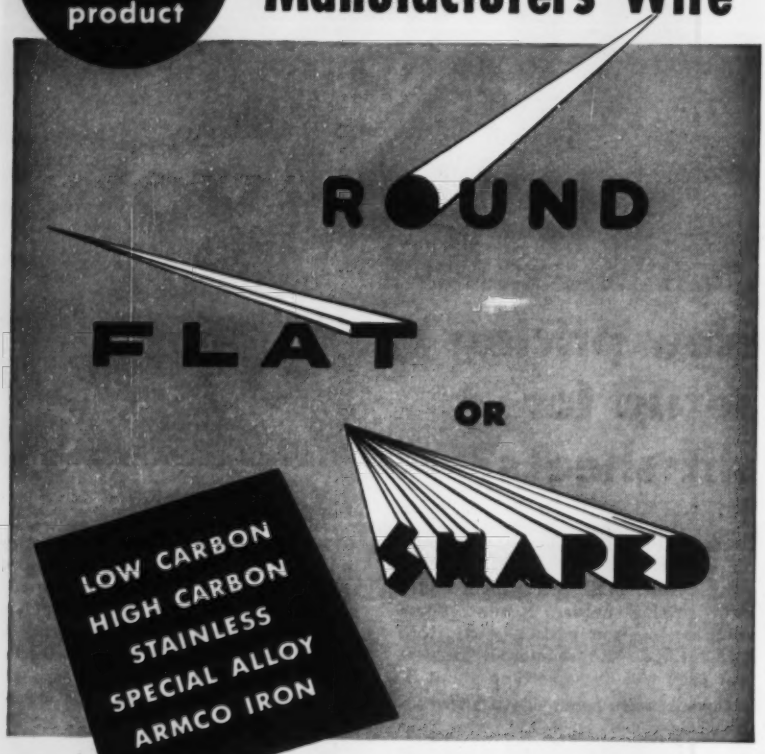
Varied Effects—This pricing problem does not affect all steel companies alike. Some companies have narrow mills only, some have wide mills only, and others have both narrow and wide mills.

Some of the narrow mills are hard-pressed for business because of the inroads of slitters. Cold strip mills that would remain in existence would be those best able to serve the demand for narrow material of special edge, finish, temper and quality. Some of the companies with cold strip mills are nonintegrated firms without sheet producing facilities.

Example—An example of this predicament confronting some companies is the Stanley Works, New Britain, Conn. It has found at its Bridgeport, Conn., plant that it cannot remain competitive. The main reason has been the development of hot and cold rolling of strip steel in wide widths and large tonnages by many

an ACCO product

PAGE
Manufacturers' Wire



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mills at lower costs than Stanley is able to achieve on its strip mill with a maximum width of only 12 inches. Eventually the Bridgeport cold mill will be closed and all cold strip production centered at New Britain, where facilities have been provided over the years for producing narrow cold strip, starting with hot strip in wide widths. (See STEEL, Aug. 2, 1954, p. 77.)

Precedent—A move in the direction of establishing a pricing basis for narrow material slit from wide sheets was made by Republic Steel Corp. in June when it issued a new book on its Electro Paintlok and Electro Zincbond sheets. Those two products, which have an electrogalvanized sheet base price, now have their own extras for widths down to ½ inch. Previously, widths under 24 inches took a cold-rolled strip base price and cold-rolled strip extras, plus electrogalvanized coating extras.

Lowers Export Steel Prices

New York—Reflecting lower export carload freight rates on eastern railroads to North Atlantic ports, U. S. Steel Export Co. has revised many of its export base prices, with freight included to New York, Philadelphia and Baltimore, effective Aug. 10. Reductions in the finished steel items range up to 20 per cent.

Stainless Steel . . .

Stainless Steel Prices, Page 148

New York—Production of stainless and heat resisting steel ingots in second quarter was off slightly from first quarter and down sharply from production in the second quarter a year ago.

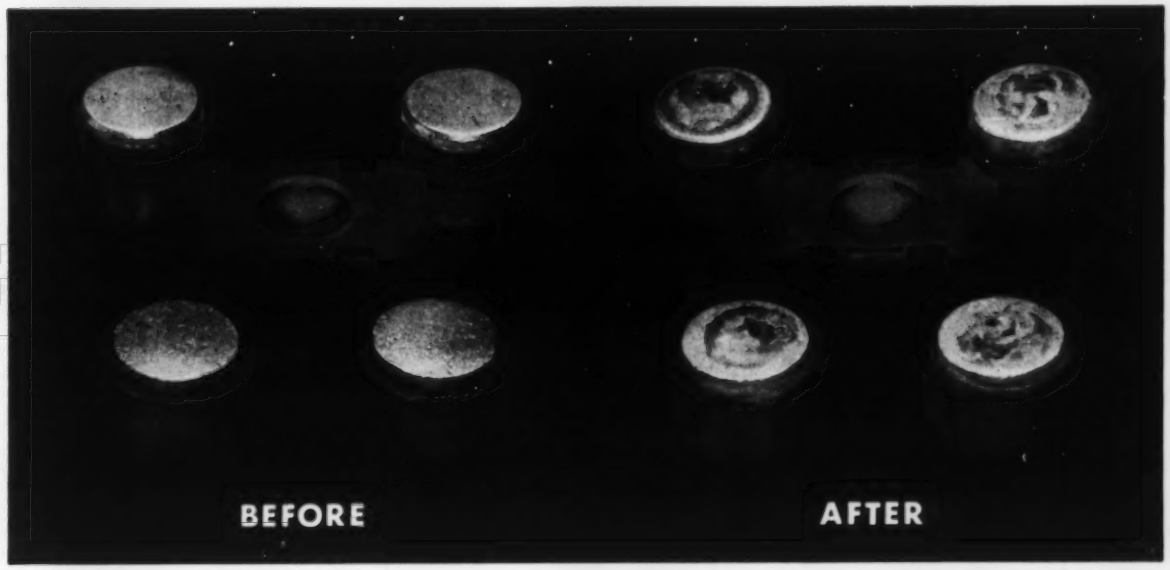
Output during the period totaled 183,702 net tons, reports the American Iron & Steel Institute. This compares with 187,111 tons in first quarter, and 290,360 tons in second quarter of 1953.

Tool Steel . . .

Tool Steel Prices, Page 148

New York — Shipments of high speed and tool steel (excluding hollow drill steel) increased in June as compared with the movement in the preceding month but were down sharply as against shipments in the like month of 1953.

June shipments totaled 7314 net tons against 6300 in May and 11,505 in June a year ago. Cumulative shipments in the first half of this year were 44,913 net tons, comparing with 63,905 in the like period of last year.



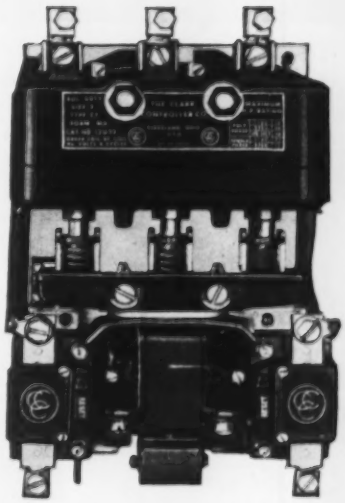
PROOF OF LOW MAINTENANCE ON CLARK TYPE "CY" STARTERS

These unretouched photos show contact tips from a CLARK Bulletin 7707 contactor—the contactor used in the standard Bulletin 6013 size 2 AC Motor Starter — as they looked before and after a year of hard use.

The contactor is in service at Cleveland Hone and Manufacturing Company, on a special transformer and rectifier circuit used in processing automotive parts. The tips shown right above were removed from the contactor after 12 months of steady service, often operating as frequently as 5000 times per hour.

Note that slight discoloration and minute pitting are the only evidence of wear. They require no cleaning, dressing or filing, and are in condition to give many more years of dependable service.

The secret of long contact life in the CLARK Type "CY" Starter is its exclusive arc-quenching principle, using strong multi-turn magnetic blowouts and double-break contacts. Forced rotation causes the arc to move continually on the contact surfaces, distributing the heat and preventing pitting or "build-up" at any one point. Result: extremely effective arc interruption, and greatly reduced wear on tips.



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June Steel Shipments Heavy

New York—Shipments of finished steel in June at 5,887,488 net tons were the largest for any month since last November, reports the American Iron & Steel Institute. Tonnage moved in the month was up 8.6 per cent over that in May when shipments amounted to 5,423,168 tons. Highest previous shipments total this year was in January when 5,727,600 tons were moved.

First half shipments totaled 33,274,530 net tons, down sharply from the 42,356,861 tons shipped in the first half of 1953, but exceeding by 1 million tons the 32,353,919 ton average of the first half years of 1947-49.

Tubular Goods . . .

Tubular Goods Prices, Page 147

Philadelphia—District demand for merchant pipe has been fairly brisk, in fact, some sellers report July as the best month to date this year, although there was and, still is, price cutting at the resale level.

Boston—Except for seamless pipe, most tubular products in wanted sizes are available from stock, including buttweld pipe, mechanical and tubing specialties.

Pittsburgh—Seamless oil country goods will probably sell strongly into fourth quarter, but other tubular products are unchanged. Buttweld demand is fairly heavy.

Steel Exports Cut Last Year

New York — Exports of finished steel products last year totaled 3.1 million tons, 26 per cent less than in 1952, although production of hot-rolled iron and steel products was 20.5 per cent greater, reports the American Iron & Steel Institute.

Six products comprised more than half of total steel exports, according to Commerce Department figures. Reported in approximate figures they were: Tin plate, 438,000 tons; structural shapes, 308,000; seamless pipe and tubing, 288,000; welded pipe and tubing, 277,000; plates, 274,000; hot-rolled sheets, 230,000 tons.

More than half of total steel exports went to five nations, all of them in the western hemisphere. They were Canada, Mexico, Venezuela, Colombia and Brazil, in the order of the tonnage received. More than 1.1 million tons were exported to Canada, 247,000 to Mexico, 200,000 to Venezuela, 115,000 to Colombia and 95,000 to Brazil. Canada was also the largest recipient of the top six ranking steel export products mentioned, except tin plate.

Steel Bars . . .

Bar Prices, Page 144

Cleveland—Although demand for merchant bars continues restricted mills are anticipating some pickup in buying next month. Generally, they expect fourth quarter will show marked improvement over third quarter, which, as in most other steel products, was pretty much of a dud because of manufacturing plant shutdowns on a wide scale for mass vacations.

Boston—Cold-finished carbon bar orders are usually for prompt shipment and a substantial ratio can be filled from stock. The same holds for alloys and stainless.

New York—While the situation a month from now may tighten, and there are many who believe it will, deliveries on hot-rolled carbon bars remain easy.

Pittsburgh—Mill sales of cold-finished bars are slowing, as are warehouse sales. While barmakers hope for a fourth quarter pickup, no gains are in sight this month or next.

Philadelphia—While hot-rolled carbon bar inventories now average less

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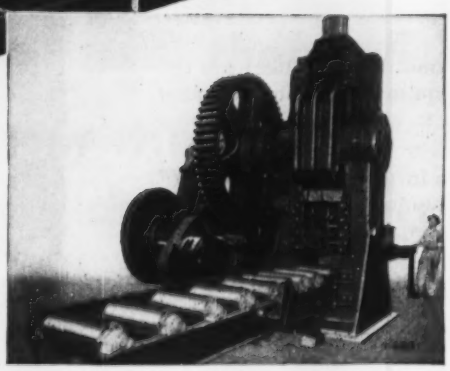

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than normal, consumers are still buying on a hand-to-mouth basis, knowing they can get mill shipments within two to three weeks on most specifications.

Cincinnati—Carbon bars are moving well. Alloy bars also seem to be holding up well, despite the slack season due to vacations.

Pig Iron . . .

Pig Iron Prices, Page 148

New York—Average daily pig iron production capacity has been sharply increased by the postwar expansion which resulted in greatly enlarging average daily furnace output.

The American Iron & Steel Institute reports last year an average of 919 net tons was produced during each blast furnace day. Never before had the average exceeded 900 tons. Twenty-five years ago it was around 655 tons.

New York—Pig iron producers anticipate an improvement in September, but see little change in immediate prospect. Operations at district consuming plants still reflect the vacation and hot weather season. Hanna Furnace Corp. reduced the price on silvery iron, 6.0-6.50 per cent silicon base, $2 a ton, to $66.25 furnace, effective Aug. 3.

Boston—Changes in production programs, General Electric Co. at Lynn, Mass., notably transfer of synchronous and specialty motors, also generator departments to the Schenectady, N. Y., and Erie, Pa., plants, will eventually result in discontinuance of the River Works iron foundry. The pattern shop will be transferred to the steel foundry, Everett, Mass.

Cleveland—Except for a reduction of $2 per ton in the base price of silvery iron, the market for merchant pig iron is without feature. Two producers of silveries now quote $65 f.o.b. furnace, and a third $66.25.

No other changes in merchant pig iron prices appear imminent. Producers failed to advance their prices upward at the opening of July when a general advance was effected in steel prices.

Resumption of operations at various foundries following vacation suspensions has not been followed by any great rush of buying. In general, foundries are ordering for needs in sight. With prompt shipments available from the furnaces they are not confronted with the necessity of carrying large inventories.

Merchant furnace operators think

(*Please turn to page* 159)

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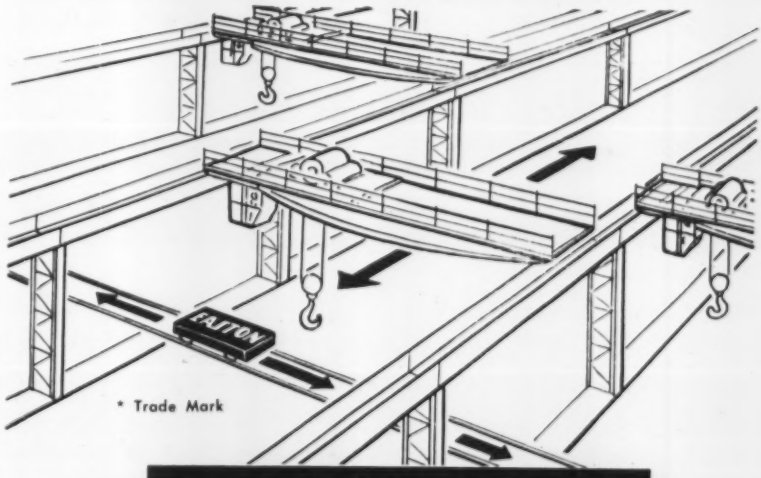

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan,Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 199 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb or alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 8.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 6% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, C.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2¼ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, Pa., $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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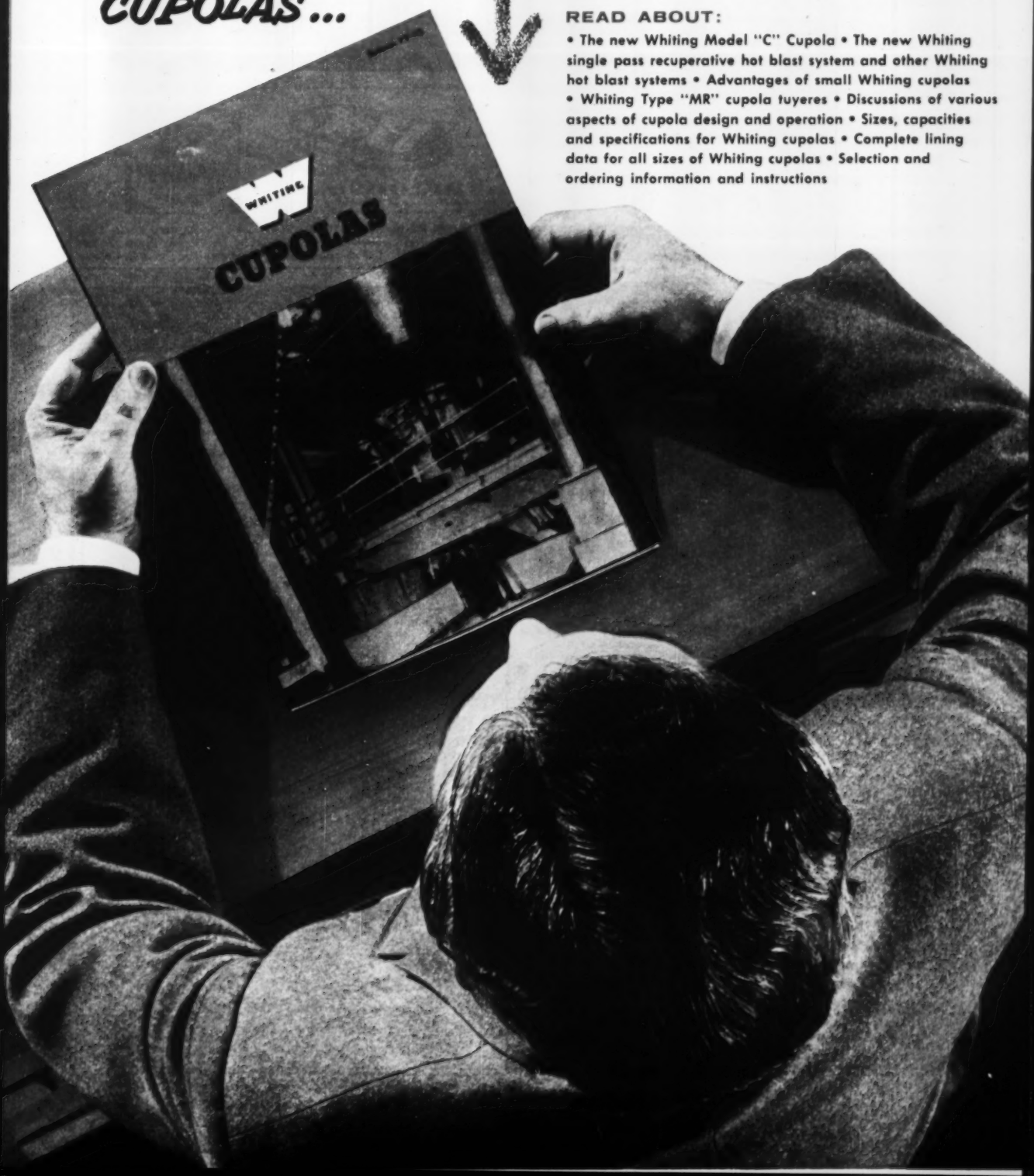

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Pig Iron . . .

(*Concluded from page* 155)

demand will drag through remainder of August, picking up about mid-September, followed by an active buying movement in October as plans of the automotive industry for last quarter jell.

Buffalo—Demand for merchant pig iron lags as foundries continue to melt at a slow rate. No improvement is seen in the immediate future. Chief interest in the market last week centered on receipt of the first shipment of iron ore from Labrador to the Great Lakes. Approximately 2500 tons were unloaded at Republic Steel's plant here.

Philadelphia—The Chester, Pa. pig iron producer is now quoting basic iron at $48, furnace, following action by this interest in establishing No. 2 foundry iron at $48.50 and malleable at $49. The Chester price on basic, as well as on the other two grades, is $10 under the quotations of other district producers.

Prices on imported iron are stronger, with good No. 2 foundry holding around $51, f.o.b. Philadelphia, duty paid.

Cincinnati—Hand-to-mouth buying prevails in pig iron. Foundries are buying only for immediate needs. Most foundrymen are waiting for a fourth quarter pickup.

St. Louis—Pig iron market continues slow, with foundry activity giving little indication of improvement. July's total shipments to outside consumers were less than four days production at capacity operations.

Birmingham—Merchant iron smelters are moving more tonnage this month than they did in July when most of the district's foundries were on vacation. Even so, all three merchant melters have one idle stack each.

Los Angeles—Howard Foundry Co. poured its first "heat" last week in the company's new "lost wax" precision investment casting foundry. The new division will undertake short pilot runs of experimental aircraft castings.

Iron Ore . . .

Iron Ore Prices, Page 159

Cleveland—Shipments of Lake Superior iron ore from the upper lake ports increased in the latest week of record, that ended Aug. 9, reports the Lake Superior Iron Ore Association. Total for the week was 2,348,253 gross tons, up 98,715 tons from the preceding week's shipments of 2,249,538 tons. The week's tonnage, however, was far under the 3,316,480

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-$25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 93c-95c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	nom. 34.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.80-$4.20
60-65%	4.65-4.75

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, Niles, O., Hays, Pa., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala. $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Peria, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.60; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa. $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburner bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	28.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.63
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
Inches		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	26.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.60
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

tons shipped in the corresponding week of 1953.

Cumulative shipments in the 1954 season to date now stand at 35,829,-170 gross tons. This compares with 54,625,524 tons moved up to the same date a year ago.

Average analyses of Lake Superior iron ore shipments for the 1953 season show iron content was 50.37 per cent, off only fractionally compared with 50.49 per cent the preceding year.

July Steel Production Down

New York — Production of ingots and steel for castings in July totaled 6,635,000 net tons, reports the American Iron & Steel Institute. This was a decline compared with output of 7,363,634 tons in June. In July, 1953, output totaled 9,275,673 tons.

Production in the first seven months of this year amounted to 50,-766,632 net tons. While this is down sharply from the 67,221,609 tons produced in the like period of last year, it is 4.4 per cent higher than the average for the three years, 1947-49.

This is revealed by the index of production which was 104.4 for the seven months based on 1947-49 as 100.

The index of production in July was 93.3, compared with 107.0 in June. July output represented 63 per cent of capacity compared with 72 per cent in June and 71.5 in the first six months.

	OPEN HEARTH			BESSEMER			ELECTRIC			TOTAL			Calculated	
Period	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	weekly production (Net tons)	Number of weeks in month
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54 9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,645,508	4.43
1st Qtr.	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,950	12.86
April	6,365,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,738	70.7	105.0	1,686,848	4.43
*June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,465	4.29
*2nd Qtr.	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
*1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
‡July	6,047,000	65.4	94.4	205,000	50.5	58.3	383,000	43.2	107.2	6,635,000	63.0	93.3	1,501,000	4.42
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,962	99.1	139.1	2,234,303	4.43
February	7,939,299	100.8	137.2	329,389	92.6	103.8	664,091	84.6	205.9	8,932,779	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,615	87.7	213.5	10,168,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,789	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,502	99.4	135.4	332,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st Half	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	129.8	324,088	82.4	92.2	635,263	73.2	177.9	9,275,673	93.1	130.4	2,098,569	4.42

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,880 net tons, total 124,330,410 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.

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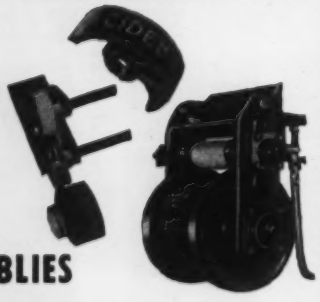

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Tin Plate . . .

Tin Plate Prices, Page 146

Chicago—Tin plate provides one of the brighter aspects of the current steel demand situation. One producer reveals deliveries have lengthened to late September-October.

Plates . . .

Plate Prices, Page 144

Boston—Part of the hull steel for eight destroyers to be built at New England yards, 11,600 tons, including superstructure, will be bought in fourth quarter.

With Pittsburgh not equalizing, plain and galvanized carbon plate prices vary from $2 to $3 per ton delivered, rail shipments subject to carload minimum rate on 40,000 pounds. Considerable tonnage shipped by truck is not in this category.

New York—Super-carrier, *Ranger*, recently noted as awarded to the New York navy yard, will require 47,200 tons of steel, apart from that required for machinery and auxiliary equipment. No early action is expected on these requirements.

Philadelphia—District plate mill operations lag badly, with deliveries available in a week to 10 days. Structural activity is sustaining bookings to some extent, but tank and boiler shops are specifying lightly and, little is coming out from the railroads and shipyards.

Pittsburgh—Plate sales continue to trail off slowly. Industrial construction, barge building and railroads have lower requirements than in second quarter.

Chicago—Volume of heavy construction is easing off somewhat although there is no dearth of work coming out for figuring. Steel plate deliveries now are in the easiest position since pre-Korea.

Portland—American Pipe & Construction Co. in addition to a $1,276,525 contract for the Portland Commission of Public Docks reports tank and pipe jobs in the shop involving about 1000 tons of plates, including 100 tons for a Bureau of Reclamation tank at Coeur d'Alene, Idaho. This plant has a six months backlog.

Beall Pipe & Tank Corp. has been awarded 800 tons of plates for a Bureau of Reclamation irrigation project at Avondale, Idaho. This pipe ranges from 4 to 24 inch, 14 gage to ¼ inch, fusion weld automatic. The same shop has 500 tons, 14,000 feet of 12¾ and 14 inch water pipe for Bend, Oreg. Contract for 500 tons of water pipe for Hillsboro, Oreg., has been completed.

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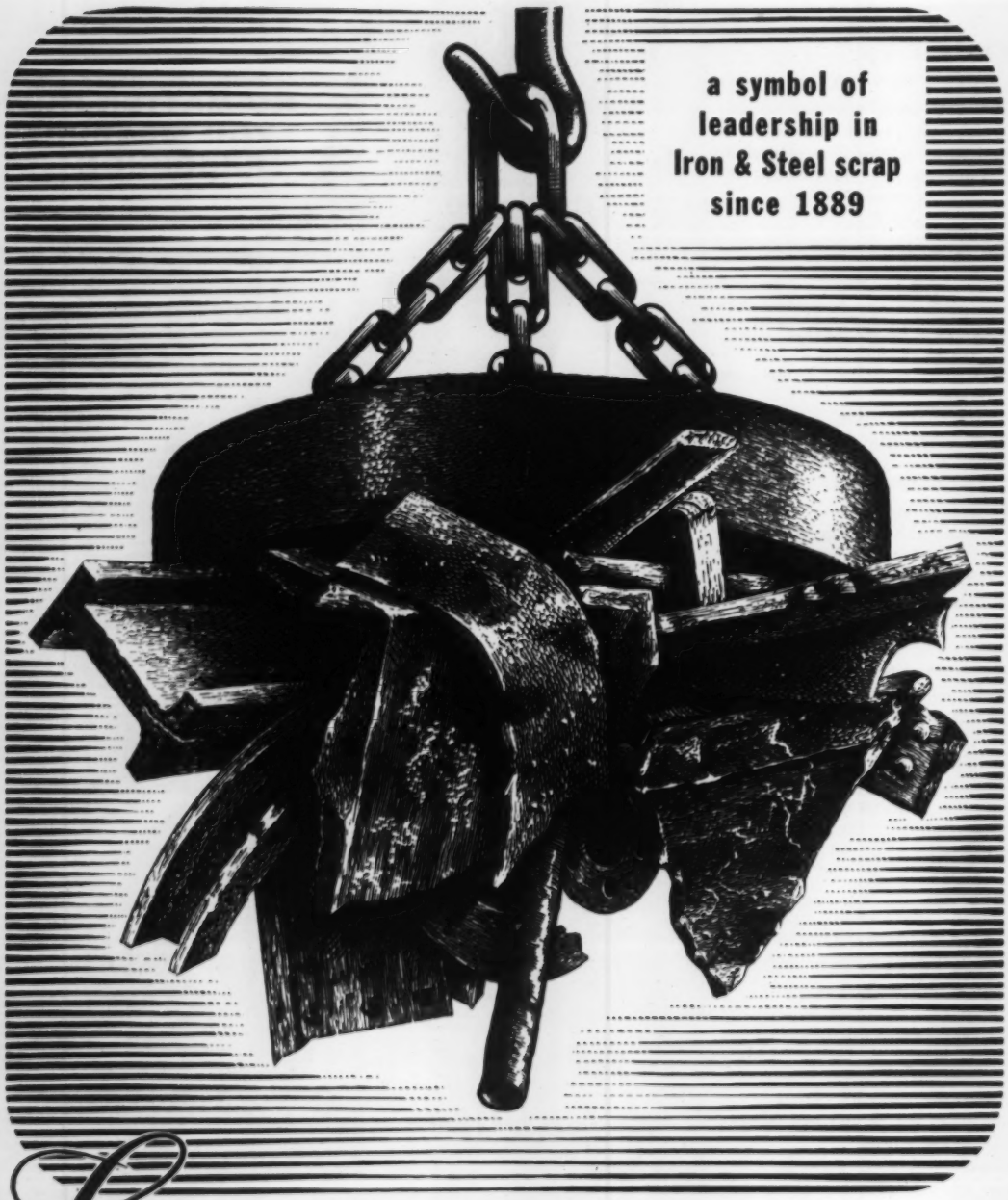

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Scrap Trading Continues Limited

Except for export movement the market is featureless. Prices generally holding but tone is weak as consumers defer purchases in face of lagging operations

Scrap Prices, Page 164

Philadelphia—Continued accumulation of scrap for export is steadying an otherwise dull market. Three part-cargoes left here recently, another is in the process of loading and at least two more shipments are expected to leave this port before end of the month. Prices are unchanged throughout the list.

Freight rates on old rails and axles in 80,000 pound carlots will be reduced 13 per cent in official classification territory Sept. 23.

Youngstown — The iron and steel scrap market here is showing a slightly improved tone. Prices for No. 1 heavy melting and No. 1 bundles still are close to the $29 to $30 a ton range, with less attractive scrap ranging somewhat lower in price.

Pittsburgh — Prime quality scrap grades command a good market. No. 1 heavy melting holds at $29 to $30, although a poor lot of that grade could be had for less.

New York—While export trading dominates the scrap market, there is some improvement in domestic buying, with brokers advancing their buying prices on several grades. They are now paying $15 to $15.50 for No. 2 bundles, $6 to $7 for machine shop turnings, $9 to $10 for mixed borings and short turnings and $10 to $11 for short shovel turnings. Prices on cast grades and stainless steel scrap are steady.

Boston—What strength is evident in heavy melting steel prices is due to buying for export. Loading or shipping recently from Boston are approximately 15,000 tons of No. 1 and No. 2 steel. For the former, depending on freight for 40-ton minimum shipments to dock, up to $19 is paid with prices generally unchanged.

Buffalo—Irregular tendencies continue to prevail in the scrap market here as cast grades dropped $2 per ton. Steelmaking grades held steady.

Cleveland—The scrap market continues to drag here. Little trading is reported and the market undertone is weak. One recent sale of No. 1 heavy melting at $29 delivered is reported. But sales under that level could be done today, brokers state. Consequently, a range of $27 to $29 is cons.dered more representative of the actual market situation pending resumption of active buying by the mills.

Chicago—The scrap market here is stable, a good sign in view of the small volume of buying.

Detroit—The No. 1 grades of scrap are stronger, but the No. 2 grades and turnings continue weak. There is a l ttle better sentiment in the market than a month ago.

Cincinnati—Fairly firm market has developed in borings and turnings, resulting in a price increase of 50 cents per ton in mixed borings and turnings, short shovel turnings and cast iron borings, based on mill purchases in large amounts.

St. Louis—Extremely soft scrap prices hold down transactions. Big melters hold comfortable inventories.

Los Angeles—Reports that offshore scrap is disturbing the market in this area are unconfirmed.

Portland—Scrap dealers report fair inventories but all scrap items, except bundles which are surplus, are in short supply. Scrap collectors find present prices unattractive and in some instances buyers are absorbing a portion of the freight from interior points.

Wire . . .

Wire Prices, Page 146

Cleveland—Although this is the season when demand for merchant wire products usually goes into a noticeable decline as the farmers divert their attention from maintenance to the care and harvesting of crops, business currently is reported holding up much better than expected.

Structural Shapes . . .

Structural Shape Prices, Page 144

Portland—Fair backlogs are reported by some fabricators. Others are in need of business. Generally, the fabricating industry is slow and with approaching completion of major public works in this area, not many large projects are up for early action. Nu-

(*Please turn to page* 166)

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Aug. 11	$28.50
Aug. 4	28.50
July Avg.	27.42
Aug., 1953	43.40
Aug., 1949	20.86

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 5 ft l'gths	*31.00-32.00*
Heavy turnings	26.00-27.00
Punchings & plate scrap	32.00-33.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Charging box cast	32.00-33.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	23.00-24.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
Rails, 2-ft and under	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Railroad specialties	34.00-35.00

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*27.00-29.00*
No. 2 heavy melting	25.00-26.00
No. 1 bundles	27.00-28.00
No. 2 bundles	23.00-24.00
No. 1 busheling	27.00-28.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings	16.00-17.00
Cast iron borings	16.00-17.00
Low phos.	28.00-29.00
Cut structural plate 2 ft and under	32.00-33.00
Alloy free, short shovel turnings	16.50-17.50
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Charging box cast	26.50-27.50
Stove plate	33.00-34.00
Heavy breakable cast	25.50-26.50
Unstripped motor blocks	25.00-26.00
Brake shoes	29.00-30.00
Clean auto cast	*43.00-44.00*
No. 1 wheels	33.50-34.50
Burnt cast	27.00-28.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
R.R. malleable	41.00-42.00
Rails, 3-ft and under	43.00-44.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	40.00-41.00
Cast steel	34.00-35.00
Railroad specialties	34.00-35.00
Uncut tires	36.00-37.00
Angles, splice bars	41.00-42.00
Rails, rerolling	45.00-46.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	29.00-30.00
No. 2 bundles	24.00-25.00
Machine shop turnings	13.00-14.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	30.00-31.00
Electric furnace bundles	30.00-31.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	26.00
No. 2 heavy melting	24.00
No. 1 bundles	26.00
No. 2 bundles	19.00-20.00
No. 1 busheling	26.00
Electric furnace bundles	27.00
Machine shop turnings	15.00
Mixed borings, turnings	16.00
Short shovel turnings	18.00
Structurals & plate	29.00-30.00
Heavy turnings	23.00
Couplers, springs, wheels	32.00
Rail crops, 2 ft & under	42.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	37.00*
Heavy breakable cast	35.50
Unstripped motor blocks	nom.
Drop broken machinery	41.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	21.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	21.00
No. 2 bundles	*15.00-15.50*
Machine shop turnings	*6.00-7.00*
Mixed borings, short turnings	*9.00-10.00*
Low phos. (structural & plate)	22.00-23.00
Short shovel turnings	*10.00-11.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	19.00-20.00*

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	18.50-19.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00-19.00
No. 2 bundles	13.00
Mixed borings, turnings	7.00-8.00
Machine shop turnings	4.00-5.00
Short shovel turnings	10.00-10.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.50-26.50
No. 2 heavy melting	22.50-23.50
No. 1 bundles	25.50-26.50
No. 2 bundles	19.00-20.00
No. 1 busheling	25.50-26.50
Machine shop turnings	11.00-12.00
Mixed borings, turnings	*14.50-15.50*
Short shovel turnings	*14.50-15.50*
Cast iron borings	*14.50-15.50*
Low phos. 18-in.	32.00-33.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 18-in. and under	43.00-44.00
Rails, random lengths	35.00-36.00

CHICAGO

No. 1 heavy melting	29.00-31.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	*31.00-32.00*
No. 1 dealer bundles	28.00-29.00
No. 2 bundles	22.00-23.00
No. 1 busheling	29.00-31.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut structurals, 3-ft	32.00-33.00
Punchings & plate scrap	32.00-33.00
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Stove plate	28.00-29.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	37.00-38.00
Drop broken machinery	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
R.R. malleable	40.00-42.00
Rails, 2-ft. and under	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Angles, splice bars	37.00-38.00
Rails, rerolling	44.00-45.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00
430 turnings	20.00-25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*22.50*
No. 2 heavy melting	*18.50*
No. 1 bundles	*23.50*
No. 2 bundles	16.50
No. 1 busheling	*21.50*
Machine shop turnings	*7.00*
Mixed borings turnings	*7.00*
Short shovel turnings	9.00
Punchings & plate scrap	24.00

Cast Iron Grades

No. 1 cupola	33.00
Charging box cast	27.00
Stove plate	29.00
Heavy breakable	*23.00*
Unstripped motor blocks	18.00
Clean auto cast	37.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	26.00-27.00
No. 2 bundles	20.00-21.00
No. 1 busheling	26.00-27.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	16.50-17.00
Short shovel turnings	17.50-18.00
Cast iron borings	16.50-17.00
Low phos.	28.00-28.50

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*35.00-36.00*
No. 1 machinery	*39.00-40.00*

Railroad Scrap

Rails, random lengths	33.00-34.00
Rails, 3-ft and under	40.00-41.00
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	*19.50-20.50*
No. 2 heavy melting	*18.50-19.50*
No. 1 bundles	18.00-19.00
No. 2 bundles	16.00-17.00
Cast iron borings	*15.00-16.00*
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	26.00-27.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	43.50-44.50
Stove plate	40.50-41.50
Bar crops and plate	29.00-30.00
Structural plate 2 ft.	29.00-30.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	39.00-40.00
Angles, splice bars	36.00-37.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	25.50
No. 2 heavy melting	23.50
No. 1 bundles	25.50
No. 2 bundles	19.25
Machine shop turnings	11.00
Short shovel turnings	*13.00*

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	29.00
Heavy breakable cast	29.00
Unstripped motor blocks	29.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	31.00

Railroad Scrap

No. 1 R.R. heavy melt.	*30.25*
Rails, 18-in. and under	40.00
Rails, random lengths	37.00
Rails, rerolling	43.00
Uncut tires	32.50
Angles, splice bars	*33.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	21.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	32.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	38.00-42.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

HAMILTON, ONT.

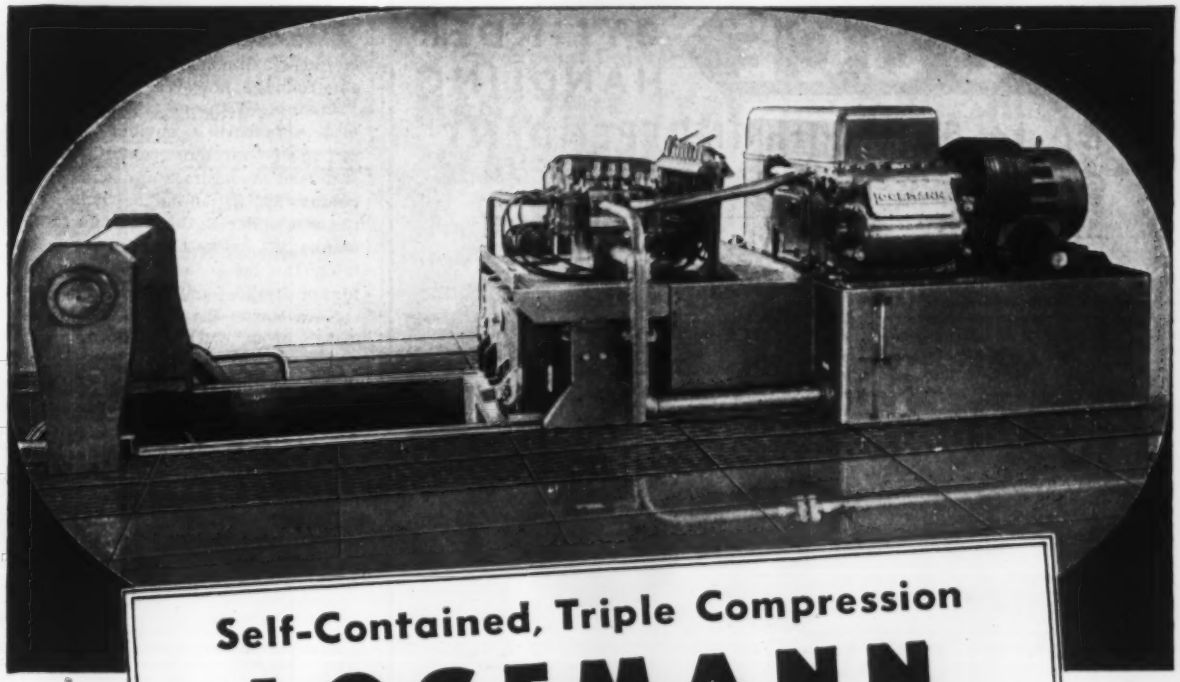
(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



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...give you compact, high density bales . . . at low cost!

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. . . for pressures from 2000 to 50,000 p.s.i. for press operation, hydrostatic tests, and similar applications.

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Here is a combination of tried and tested units expertly assembled to reduce floor space requirements to a minimum. Features include a big box, high speed operation, and high density bales. Various box sizes are available to meet maximum scrap and minimum bale dimensions.

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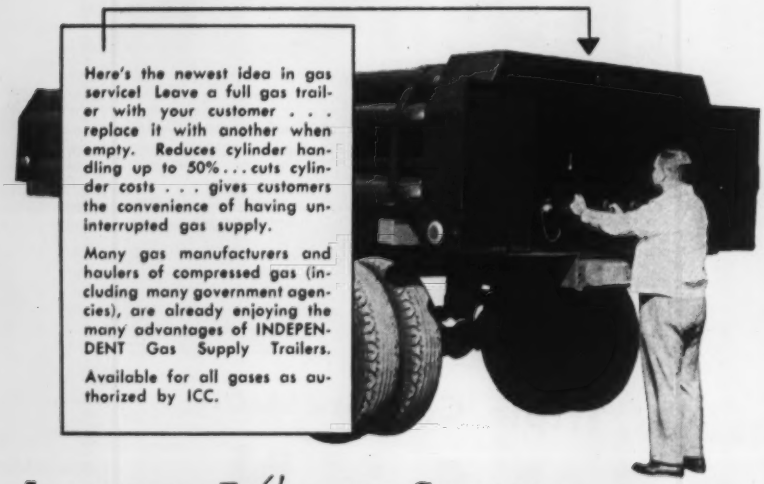

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Many gas manufacturers and haulers of compressed gas (including many government agencies), are already enjoying the many advantages of INDEPENDENT Gas Supply Trailers.

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Also represented in other principal cities.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture

(*Concluded from page* 163)

merous small contracts total considerable tonnage, however.

Boston—With one mill at 3.95c, the price structure is obviously directed to meet foreign competition on standard structurals and wide flange beams up to 10-inch. This is $4 per ton under Bethlehem and Lackawanna; $3 below the Pittsburgh district, the latter not equalizing with higher freight considered.

New York—Structural steel activity is brisk, with orders diversified and inquiry featured by several thousand tons of bridge work for the New York state thruway, on which bids will be closed Aug. 19.

Philadelphia — Competition among structural fabricators is still strong, but it is a shade less sharp.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6900 tons, viaduct, Hudson county extension, Newark, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

3135 tons, bridge superstructure, Chicopee, Mass., to Phoenix Bridge Co., Phoenixville, Pa., $949,800. Bethlehem Steel Co., Bethlehem, Pa., was second low bidder at $986,425.

2600 tons, state bridge, Vine street, Philadelphia, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

2290 tons, office, United Fuel & Gas Co., Charlestown, W. Va., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1638 tons, state bridge, Westchester county, New York, through Corbetta Construction Co. and Yonkers Contracting Co., serving jointly as general contractors, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1525 tons, boiler and turbine building, Philadelphia, through Nalan Construction Co., general contractor, to Belmont Iron Works, Eddystone, Pa.

1500 tons, also conveyors and other equipment, grain storage expansion, Portland Commission of Public Docks, to American Pipe & Construction Co., Portland.

1015 tons, ventilator building, Lincoln Tunnel, New York, through Colmar Construction Co., to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, relocation project, The Dalles dam, Columbia river, to American Bridge Division, U. S. Steel Corp., Portland; Lee Hoffman, Beaverton, Oreg., general contractor.

928 tons, state bridge, Camden, N. J., through George M. Brewster & Son, general contractors, to New York Shipbuilding Corp., Camden, N. J.

905 tons, Medical Center, Syracuse, N. Y., through Lasker-Goldman Corp., general contractor, to Bethlehem Steel Corp., Bethlehem, Pa.

830 tons, power facilities, Carbide & Carbon Chemical Co., Torrance, Calif., to a Pacific coast fabricator.

700 tons, building, General Electric Realty Co., Nela Park, Cleveland, to Burger Iron Co., Akron, O.

700 tons, warehouse, Owens-Illinois Glass Co., Alton, Ill. to American Bridge Division, U. S. Steel Corp., Pittsburgh.

650 tons, 12-story apartment, East 35th street, between Park and Madison avenues, Peribinder Realty Corp., New York, to Harris Structural Steel Co., that city.

566 tons, North High School, Valley Stream, N. Y., through Leon D. DeMatteis Construction Co., to Simon Holland & Son Inc., Brooklyn, N. Y.

566 tons, South High School, Valley Stream, N. Y., through Ed Corning to Simon Holland & Son Inc., Brooklyn, N. Y.

470 tons, 12-story apartment, 116 East 56th street, New York, through Tandy & Allen Construction Co., to Dreier Structural Steel Co. Inc., Long Island City, N. Y.

FOR SALE

One Shaw-Box Overhead Crane. Has 50-foot span, 10-ton capacity. Good condition. Full particulars on request.

Reply Box 108, STEEL
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LATE MODEL HYDRAULIC UNIVERSAL TESTING MACHINE. APPROX. 30,000 LB. CAPACITY.

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ATCHISON, KANSAS

"WANTED"

AUTOMATIC POWER HACK SAW 220V3P SIZES 10" x 10" and 14" x 14" MUST BE LATE MODEL. ADVISE MANUFACTURER, SERIAL NUMBER AND PRICE.

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Production Engineer with at least five years' experience in steel fabrication; must have college engineering degree. Wanted by small but very highly regarded and long established firm situated in small city on Lake Erie. This will be a lifetime position of responsibility for the right man. Apply in writing giving past employment history and detailed qualifications and state immediate and ultimate salary desired. Reply Box 105, STEEL, Penton Building, Cleveland 13, Ohio.

QUALIFIED BLAST FURNACE SUPERINTENDENT or Assistant on single stack plant. Give experience, education and salary expected. Write in detail. Reply Box 978, STEEL, Penton Building, Cleveland 13, Ohio.

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Small, financially strong, Ohio steel plate and alloy fabricating plant with long record of profitable operation has opening for man of highest type. Permanent position with unlimited opportunity for growth. Must be thoroughly experienced in code welding practice, maintenance, costs and able to organize production and get results. Enclose photograph and give full experience with references and salary bracket expected. Only fully qualified need apply. Reply Box 997, STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

PLANT MANAGER

M.I.T. Engineering Graduate with Proven Record in Plant Supervision and Control of Related Functions Dealing with Production Planning, Tooling, Quality, Maintenance, and Industrial Engineering. Reply Box 100, STEEL, Penton Building, Cleveland 13, Ohio.

PURCHASING EXECUTIVE. Top organizer, multi-plant administration, sales type, 39, broad steel-raw material experience. Many years with present employer. Staff level desired. Reply Box 107, STEEL, Penton Building, Cleveland 13, Ohio.

Representatives Wanted

Manufacturers of heavy duty Integral Horsepower Polyphase motors for thirty years desire sales representation in Pittsburgh, Cleveland and Buffalo districts. Reply Box 106, STEEL, Penton Building, Cleveland 13, Ohio.

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With Integral Hydraulic System, Drives and Electrical Equipment, for Handling and Manipulating Forging Ingots weighing up to 75 Tons.

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RAILWAY CARS—
ALL TYPES
"SERVICE-TESTED"
FREIGHT CAR REPAIR PARTS
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RAILWAY TANK CARS
STORAGE TANKS
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STEEL OR ALUMINUM

parts or assemblies requiring:

BLANKING AND COLD FORMING
(Capacity: 24 to 500 tons—20'length)
12 press brakes • 1 hydraulic press
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STAMPING, DRAWING, NOTCHING
(Capacity: 20 to 126 tons)
13 presses
blank sizes to 25½" x 32"

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(Capacity: 3/16" mild steel in 12' lengths)
10 power shears, most equipped with micrometer gauges

WELDING
spot and seam resistance welding
(stationary and portable), 50-150 KVA
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5 barge lines, 17 rail lines, 82 motor freight carriers providing competitive service to all principal cities in America.

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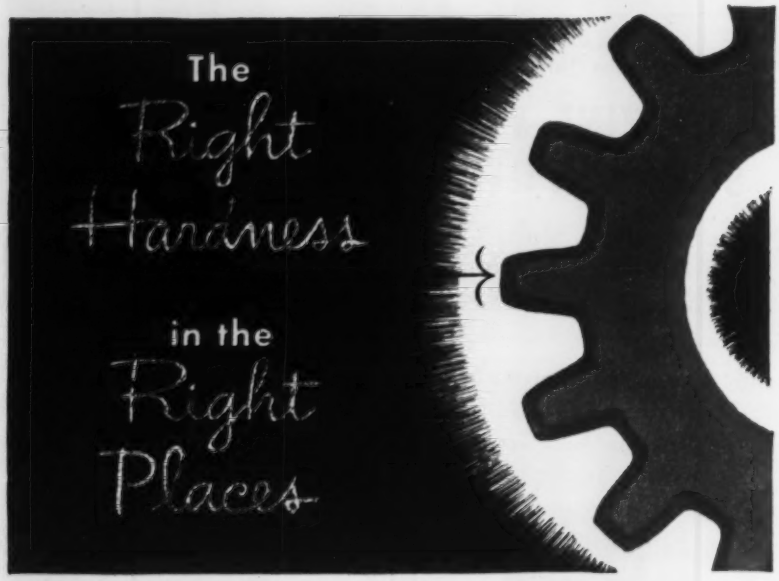

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Only PITTSBURGH **Armored Gears** are made according to the exclusive PITTSBURGH formula which covers a proven combination of metal, machining, AND heat-treating. It is not enough to use tool steel, which often will not stand shock loads. PITTSBURGH selects the best metal for the particular gear body, then machines it, and heat-treats the wearing surfaces to give ultimate life.

This process gives you gears that have tough, ductile cores, and teeth that wear almost interminably. PITTSBURGH **Armored Gears** are guaranteed to give five times the life of untreated gears, one to one and one-half times the life of oil-treated gears, and equal or longer life than any other gear in identical service. You can identify them by their "**Pittsburgh Purple**" corrosion preventive coating.

You'll never know how good PITTSBURGH **Armored Gears** are until you try them. Send us your specifications or give us details of service requirements so that we can make recommendations.

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Neville Island
Pittsburgh 25, Pa.
Phone: SPaulding 1-4600

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

443 tons, state bridge, Nassau county, New York, through Horn Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

436 tons, state thruway bridge, Westchester county, New York, through Yonkers Construction Co., general contractor, to Ernst Iron Works Inc., Buffalo.

420 tons, factory, American Can Co., St. Paul, Minn., to Mt. Vernon Bridge Co., Mt. Vernon, O.

415 tons, administration building, Lincoln Tunnel, Weehawken, N. J., through James Mitchell, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, including 334 tons for a fluid coker tower structure and 66 tons for a flare stack structure, Baltimore, through Becthel Corp., to Belmont Iron Works, Eddystone, Pa.

400 tons, hangar Air Reserve Training Center, Bedford, Mass., through F. D. Rich Co., Stamford, Conn., general contractor, to the J. & B. Iron Works, Connecticut.

385 tons, addition, nurses home, St. Peters Hospital, Albany, N. Y., through John P. Sewell, general contractor, to James McKinney & Son Inc., that city.

350 tons, land section, third tube, Lincoln tunnel, Weehawken, N. J., through Grow Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

280 tons, central heating plant and fuel oil storage building, Portsmouth, N. H., air base, through Arthur Venneri Co., Westfield, N. J., general contractor, to White Plains Iron Works, White Plains, N. Y.

275 tons, two beam bridges, Hartford Windsor, Conn., Hartford - Springfield expressway, through Brunalli Construction Co., Southington, Conn., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

270 tons, boiler house, Cutler Co., Perrini, Fla., through Ebasco Services Inc., Engineers, to Bushnell Steel Works Inc., Tampa, Fla.

260 tons, Oregon state Umpqua river bridge, to Poole, McGonigle & Dick, Portland.

195 tons, factory and office, Kienle & Co., Huntington, N. Y., through Christie V. Leiser Co., to the Mansfield Iron Works.

153 tons, state bridge, Bergen county, New Jersey, through Union Building & Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, state hospital addition, Mansfield, Conn., through E. F. Poriss, general contractor, to a local district fabricator.

145 tons, hangar, air base, Bedford, Mass., through F. D. Rich Co., Stamford, Conn., to Capitol Steel Co., Hartford.

110 tons, state office and storage building, Binghamton, N. Y., through Avella Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Oregon state highway project in Portland, to Poole, McGonigle & Dick, Portland.

STRUCTURAL STEEL PENDING

13,000 tons, superstructure, Philadelphia approach, Philadelphia-Gloucester bridge, Delaware River Port Authority, bids Sept. 8.

2443 tons, bridge work, state thruway, Chautauqua and Erie counties, New York, bids Aug. 19.

1350 tons, bridge work, state thruway, Niagara county, New York, bids Aug. 19.

960 tons, state bridge, Gaithersburg, Md., bids Aug. 17.

900 tons, bridge work, state thruway, Chautauqua county, New York, bids Aug. 19.

775 tons, bridges, state thruway, Chenung county, New York, bids Aug. 19.

750 tons, store, Lit Bros., Camden, N. J., bids Aug. 25.

725 tons, six state bridges, route 3, Duxbury-Kingston, Mass.; Central Construction Co., Lawrence, Mass., low, general contractor.

691 tons, bridge work, state thruway, Montgomery county, New York, bids Aug. 19.

465 tons, two overpasses, Nashua, N. H.; also 125 tons of reinforcing bars; bids in.

425 tons, state bridge, Frederic, Md., bids closed Aug. 10.

275 tons, Bald Eagle High School, Center county, Pa., bids Aug. 19.

200 tons, Reading railroad bridge, Berkes county, Pa., bids Aug. 26.

140 tons, state bridge, Piney Hill, Md., bids closed Aug. 10.

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33 years ago they told me:

"YOU HAVE LESS THAN A YEAR TO LIVE!"

"MUST HAVE BEEN back in 1919 or '20. Hopeless case of diabetes. No known cure . . .

"BUT HERE I AM. They found a treatment—insulin—in time. Today, *nobody* has to die of diabetes.

"CANCER, I know, is a tougher problem. But the laboratories can lick that one, too—with our support. Already, they're curing people who would have been done for a few years ago. Last year—thanks to $5,000,000 allocated by the American Cancer Society from our contributions—they found out a lot more . . . though there's still a long way to go.

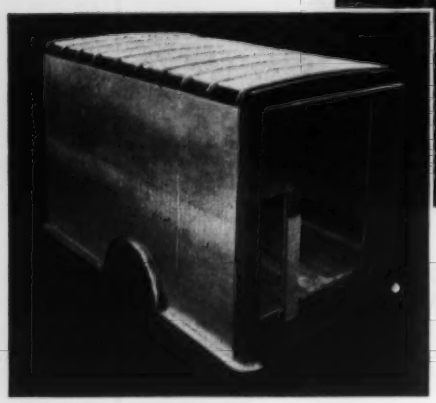
"THEY NEED MONEY, though. $5,000,000 is still less than 4 cents per American *per year*. Not enough. Not enough to find the answer *fast* enough—230,000 Americans are going to die of cancer *this year*, they say.

"I'M NOT RICH, but I gave 'em $50 last year—hope to do better this time. After all, where would *I* be if the laboratories working on diabetes, that time, hadn't been given enough support—?"

Cancer
MAN'S CRUELEST ENEMY
Strike back—Give

AMERICAN CANCER SOCIETY
GENTLEMEN:
☐ Please send me free information on cancer.
☐ Enclosed is my contribution of $..... to the cancer crusade.
Name.....
Address.....
City.....State.....
Simply address the envelope: CANCER c/o Postmaster, Name of Your Town

Panels and roof for this Nabisco truck body were fabricated from Electro Paintlok by McCabe-Powers Auto Body Co., St. Louis, Mo.



IF YOU PAINT ON STEEL

this may deliver an idea to you

For National Biscuit Company, customer attraction starts on the street. Therefore, lasting paint adherence, long service life and attractive appearance are extremely important on Nabisco delivery trucks.

To obtain these results, even under extreme weather conditions and hard service, Electro Paintlok is used for Nabisco truck bodies.

Electro Paintlok is the zinc plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them for years.

And, even though the painted surface should become scratched, the tight zinc coating guards against underfilm corrosion and creeping rust.

Republic Electro Paintlok is easy to fabricate, too. The tight zinc coating will not crack, peel or flake during normal fabricating operations. Surfaces require no pre-etching. They are preconditioned for painting.

Get the full story on Republic Electro Paintlok for your fabricated steel products that need to look better longer. Write:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Building, New York 17, N.Y.

REPUBLIC
ELECTRO ZINC PLATED SHEETS
ELECTRO PAINTLOK • ELECTRO ZINCBOND

REPUBLIC STEEL

Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron

A STUDY OF ALUMINUM SHEET ANNEALING

Fabricators of aluminum sheet products that require severe forming or deep drawing are familiar with the drawbacks of using material with irregular grain structure and/or a heterogeneous hardness pattern. Excessive grain size appears in the form of "orange peel" effect, and when directional properties are not closely controlled, "earing" is apt to occur.

The "orange peel" detracts from the product finish and requires costly secondary operations to remove, and above normal "earing" means excessive scrap with frequently an extra trimming operation.

Photograph illustrates seven types and shapes of drawn aluminum alloy cups exhibiting varying degrees of ears.

SCOVILL MANUFACTURING CO. LEADS THE WAY

Two years ago the Scovill Manufacturing Co., Waterbury, Conn., a producer of aluminum sheet since 1889, in anticipation of future requirements of industry, set into operation an aluminum annealing system that was the result of years of planning and experimentation. They wanted to provide a sheet with exceptional uniformity of physical properties and grain structure with an especially fine finish. And, they wanted to offer this strip in extra-long coils.

Scovill studied all existing methods of annealing and selected the Lee Wilson Bell Type Radiant Fired "O" Tube Furnace with Controlled Nitrogen Atmosphere as the equipment best suited to do the job.

Photograph illustrates varying degrees of "orange peel" effect.

In 1952 the installation was completed. It comprises two furnaces and six bases. Each furnace is equipped with 12 Lee Wilson "O" tubes with a total input of 3,600,000 BTU per hour at maximum fire rate. To get the most effective heat transfer possible, Lee Wilson convector plates are placed between stacked coils of the charge.

WILSON FURNACES ARE FAST

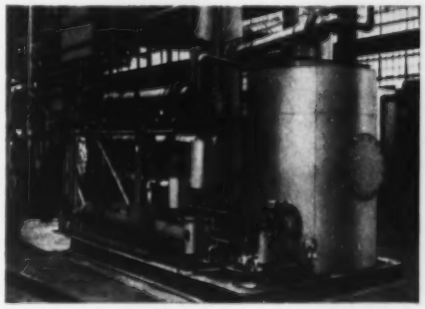
A study of coil size requirements resulted in a base which can load three stacks of 36" diameter coils with a piling height of approximately 60" net per load. In determining piling height, deformation and sticking of bottom coil edges were considered. Large coil requirements were considered in designing furnace diameters. With full charges of coils large enough to utilize convector plates, production per furnace with three bases is about 2500 lbs. per hour, or 5000 lbs. per hour for the installation.

NITROGEN ATMOSPHERE USED

For the first time in the history of aluminum annealing, nitrogen atmosphere is used. By keeping oxygen away from the aluminum during the annealing cycle, the formation of surface oxides is eliminated. The natural aluminum finish is retained.

What have Scovill and its customers to say about this controlled annealing? "We are getting," say Scovill officials, "sheet with controlled grain sizes, tempers, directional properties and dimensions far closer than once was thought possible. The control we can exert over the charge with the bell type furnace and regulated high input firing tubes in an oxygen-free atmosphere enables us to produce sheet of exacting grain structure and hardness with perfect uniformity throughout the entire charge."

Scovill has received glowing commendations from its customers which substantiate the above statement. Scovill calls this "new" aluminum sheet Truspec.

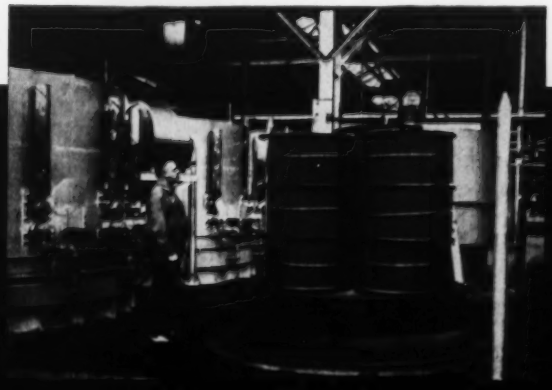


Generator which produces dry nitrogen atmosphere for the annealing process. A product of Gas Atmospheres, Inc., a Lee Wilson enterprise.

GET THE COMPLETE STORY

If you are in the business of producing aluminum or any non-ferrous or ferrous metal in strip, sheet, coil or wire and rod forms, check first with a Lee Wilson engineer before you buy annealing equipment.

Typical full charge of 36" diameter aluminum coils with convector plates in place.



Comprehensive view of the Scovill annealing installation of Lee Wilson bell type furnaces of the high convection type.

Lee Wilson Engineering Company • Inc.

20005 West Lake Road • Cleveland 16, Ohio

Slits, coils 1/8" steel at high speeds

... with cutters on TIMKEN® bearings

STEEL of ¼-inch thickness is slit and coiled at high speeds by this Stamco 60" Coil Slitter. To carry the heavy loads and to keep the cutters aligned, Stamco mounts the cutter arbors on Timken® tapered roller bearings. And to assure a smooth, even transmission of power, all gear reduction units are mounted on Timken bearings.

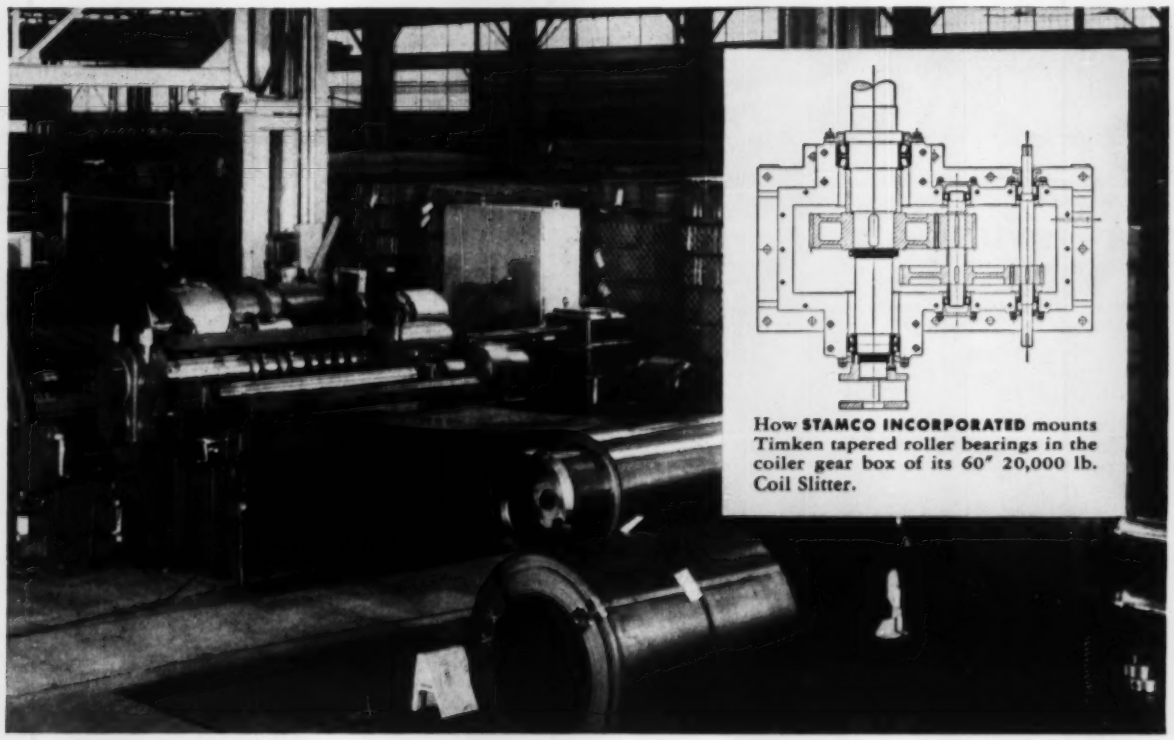
Line contact between the rollers and races of Timken bearings gives them extra-carrying capacity. And their tapered design enables them to take both radial and thrust loads in any combination. Cutter arbors are kept in positive alignment, insuring precise slitting even at high speeds (on light-gauge steel up to 2,200 feet per minute).

Because reducer shafts are also held in rigid alignment, gears mesh accurately to give a smooth flow of power, less gear wear, less maintenance. Power loss is further reduced because the true rolling motion and smooth surface finish of Timken bearings make friction negligible.

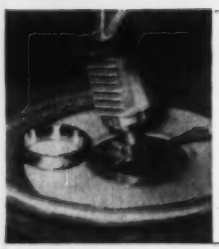
These bearings are made of the finest steel ever developed for bearings—Timken fine alloy steel. We have to make it ourselves because that is the only way we can get steel good enough for Timken bearings. They normally last the life of the coil slitter.

No other bearing gives you all the advantages you get with Timken bearings. Specify them for all the machines you build or buy. Look for the "Timken" trade-mark on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **STAMCO INCORPORATED** mounts Timken tapered roller bearings in the coiler gear box of its 60" 20,000 lb. Coil Slitter.



FINISHED TO CLOSER TOLERANCES

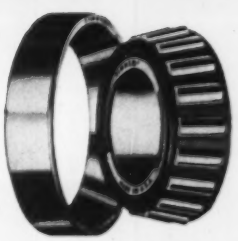
Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods at the Timken Company.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬭ AND THRUST →⬭← LOADS OR ANY COMBINATION →⬭←